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Five-Year Review Report

Second Five-Year Review Report for the Cross Brothers Pail Recycling Superfund Site Pembroke Township, Illinois

September 2005

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved By:

Richard C Karl

Richard C. Karl, Director
Superfund Division
U.S. EPA, Region 5

Date:

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Five-Year Review Report
Table of Contents

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CFR	Code of Federal Regulations
ESD	Explanation of Significant Difference
FS	Feasibility Study
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDEQ	Michigan Department of Environmental Quality
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCB	Polychlorinated Biphenyl
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI	Remedial Investigation
RI/FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
TAL	Target Analyte List
TCL	Target Compound List
SVOC	Semi-Volatile Organic Compound
UAO	Unilateral Administrative Order
VOC	Volatile Organic Compound

Executive Summary

The remedy for the Cross Brothers Pail Recycling Superfund Site included the removal of PCB-contaminated soils and the construction and operation of a groundwater treatment system that was enhanced to provide soil flushing in areas of historical contamination. The site achieved construction completion with the signing of the Preliminary Closeout Report on June 6, 1996. The first Five-Year Review was signed on August 31, 2000. The trigger for this five-year review was the signing of the first five-year review.

The assessment of this five-year review found that the remedy was constructed in accordance of the requirements of the Record of Decision (ROD) and that the operation of the groundwater treatment / soil flushing system met the requirements of the U.S Environmental Protection Agency (EPA). The system was allowed to enter a Trial Shutdown Period in December 2000 when data showed that influent concentrations were meeting treatment criteria. Since the commencement of the Trial Shutdown, quarterly groundwater monitoring for indicator parameters was performed, with a complete round of groundwater data (TAL, TCL, plus quantification of 3,3,5-trimethylcyclohexanone) collected to ensure that U.S. EPA would have a full understanding of residual groundwater concentrations. On September 28, 2004, U.S. EPA issued an Explanation of Significant Difference to modify the acceptable endpoints for remedial action and to clarify the institutional control requirements at the site. The Potentially Responsible Parties (PRPs) have prepared a draft report that quantifies risks for residual levels of contaminants in groundwater. This report, the Risk Reassessment Report, is currently under U.S. EPA review. Based upon the groundwater concentrations remaining at the site, this Five-Year Review recommends the permanent closure of the groundwater treatment/soil flushing system and additional groundwater monitoring to determine the appropriate time to rescind the groundwater use restrictions.

Based on current land use, the cleanup is considered protective. Based on RI data and the remediation of PCB-contaminated soils, the soil cleanup is complete. Because the source areas were so large and there was a concern that pockets of contamination could exist that weren't identified in the RI, current access is restricted. Once the site is closed, residential and agricultural uses will be prohibited in the historic source areas.

Overall, groundwater appears to meet the risk end-points of the 2004 ESD and the Five-Year Review recommends the permanent closure of the groundwater treatment system. With the current groundwater use restrictions in place, the groundwater cleanup is considered protective. However, there were two identified MCL exceedances for metals that should be reevaluated prior to the future lifting of groundwater use restrictions. To err on the side of caution, 3,3,5-trimethylcycohexanone, iron, and aniline levels should also be reevaluated prior to the next Five-Year Review to ensure that unrestricted use of groundwater is appropriate and protective.

SITE IDENTIFICATION

Site name ***(from WasteLAN)*****:** Cross Brothers Pail Recycling

EPA ID ***(from WasteLAN)*****:** ILD980792303

Region: 5	**State:** IL	**City/County:** Pembroke Township / Kankakee County

SITE STATUS

NPL status: X Final ☐ Deleted ☐ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction ☐ Operating **X Complete**

Multiple OUs?* ☐ YES **X NO**	**Construction completion date:** _6_ / 6 / 96

Has site been put into reuse? ☐ YES **X NO**

REVIEW STATUS

Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: Terese A. Van Donsel

Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA Region 5

Review period:** ___2 / 22 /05_____ to ___7/ 20 / 05_____

Date(s) of site inspection: 7 / 8 / 05

Type of review:
X Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) **X 2 (second)** ☐ 3 (third) ☐ Other (specify)

☐ Actual RA Start at OU#____
-Year Review Report
☐ Other (specify)

Triggering action date ***(from WasteLAN)*****:** _8_ / 31 / 00

Due date ***(five years after triggering action date)*****:** 8 / 31 /05

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Issues:

U.S. EPA evaluated residual groundwater contaminant concentrations on Site and in residential wells. Specific concerns associated with 3,3,5-trimethylcyclohexanone, beryllium, arsenic, iron and aniline were reviewed.

3,3,5-Trimethylcyclohexanone - Risks from 3,3,5-trimethylcyclohexanone appear to be within the acceptable risk range, as defined by the 2004 ESD. Based on the draft Risk Reassessment Report, the plume of 3,3,5-trimethylcyclohexanone at the site does not appear to present a carcinogenic or noncarcinogenic risk that exceeds the limits established by the ROD, as modified by the 2004 ESD. The use of isophorone as a surrogate for the carcinogenic and non-carcinogenic risk calculations was thought to be an appropriate and conservative approach to evaluate risk for this routinely identified Site contaminant

Beryllium - A single MCL exceedance of beryllium is within the area with restricted groundwater use. There were no valid detections of beryllium during historical monitoring events in 1987 and 1988, and it was determined that beryllium was not present at the Site. Up until the complete round of sampling and analyses required by U.S. EPA to evaluate the appropriateness of Site closure, routine sampling at the site was limited to indicator parameters and excluded inorganics. The significance of the single beryllium MCL exceedance at MW-104 should be considered as the monitoring results are compared to the 2004 ESD cleanup criteria, and groundwater in the area of MW-104 should be resampled to reevaluate the issue prior to the lifting of groundwater use restrictions. Because groundwater use is restricted, this review finds that the cleanup is currently protective of human health. However, the need for future restrictions on groundwater use in the area of MW-104 will need to be considered during the Site closure process.

Arsenic - A single unverified exceedance of arsenic is also within the area of restricted groundwater use. Arsenic was not historically a contaminant of concern at the site and the detection of arsenic at a concentration slightly above the MCL at MW-108 is not definitive. With the current groundwater restrictions in place at the Site, the cleanup is currently protective. However, to err on the side of protectiveness, the MCL exceedance at MW-108 should be reevaluated prior to the next Five-Year Review to determine whether it is appropriate to lift groundwater use restrictions

Iron - Iron is elevated in some wells, but does not appear to raise the Hazard Index to a level of concern. - Iron has been found to be elevated above background in several monitoring wells. While not a carcinogenic risk, the draft Risk Reassessment Report iron does show that iron does raise the Hazard Index slightly above 1 at monitoring wells MW-M3 and MW-108 and in an off-Site residential well. The maximum HI from iron is 2.7 at source area well MW-M3. Based on the calculations in the draft Risk Reassessment Report, this review finds that that there is no cause to question the protectiveness of the cleanup based on the elevated concentrations of iron.

Aniline - Aniline was found in a single downgradient well, but as of yet is not connected to site activities and does not raise the risk from possible future groundwater consumption above the criteria established in the 2004 ESD. Based on the groundwater data, the Site Potentially Responsible Parties expressed concern to U.S. EPA that there may be an aniline source in soils near NE-10. The area in question was sampled by the U.S. EPA Region 5 Emergency Response Division. Preliminary results show that there were no detections for aniline.

Recommendations and Follow-up Actions

The single, localized MCL exceedance of beryllium and the possible arsenic MCL exceedance should be reevaluated prior to the lifting of the groundwater use restrictions, but additional groundwater treatment with the current treatment system is not warranted to address these two contaminants. The presence of aniline at NE-10 appears unrelated to the primary source area addressed in the RI and the ROD, but should also be monitored before water use restrictions are lifted. The carcinogenic risk from residential use of groundwater at NE-10 is the highest found at the Site ($1.3x10^{-5}$), but is basically consistent with the upper bound established in the 2004 ESD of $1x10^{-5}$.
It is recommended that downgradient residential wells and a subset of Site wells be re-sampled prior to the next Five-Year Review to ensure that residential wells remain safe and to determine whether and when it is appropriate to lift groundwater use restrictions at the Site.

The groundwater treatment system at the Site has not been in operation for nearly five years, and residual levels of contaminants in groundwater across the Site appear to meet the requirements of the ROD, as modified by the 2004 ESD. It is therefore recommended that the closure of the groundwater treatment system should be made permanent.

It is further recommended that soil sampling be conducted in the area around well NE-10 to investigate the possible presence of an aniline source area and to ensure that there are no unacceptable risks to current or future residents, workers or trespassers. Since a connection to the Cross Brothers Site has not yet been established, this work will be considered separate from the Cross Brothers Site. The extent of contamination will be determined and, if contamination requiring action is found, an investigation will be undertaken to determine potential liability.

Recommendations / Follow-Up Actions	Responsible Entity	Oversight Party	Deadline
Sampling of Off-Site Residential Wells and Site Monitoring Wells – Data to be used for evaluation of groundwater use restrictions and to verify that off-site wells remain safe.	U.S. EPA Region 5	U.S. EPA Region 5	No later than December 2009. Additional sampling will be dependant on results of groundwater monitoring.
Finalization of Closure Report - to document work completed at site and complete institutional control plan, including title commitment, to evaluate existing controls and implement any future institutional control requirements.	PRPs	U.S. EPA Region 5	April 30, 2006

Protectiveness

The cleanup is currently considered protective. Based on the RI data and documentation of the removal of PCB-contaminated soils, there are no remaining soil concerns at the Site. However, since the Site investigation could not sample every area where waste could have been dumped, land use restrictions currently prohibit access to the historic source areas and address concerns about any residual pockets of contamination that were not seen during the investigation. A Declaration of Covenants, Conditions, Restrictions and Easements was recorded on March 20, 1991, prohibiting the then current owner, James Cross, and any future owners, from any use of the source areas, Lots 19 and 20, that would interfere with the remedy. The land use restrictions prohibit any use of the source areas, including residential, agricultural or industrial uses, and prohibits the extraction or use of groundwater. Once the site is closed, residential and agricultural development will be restricted in the source areas as an extra precaution. With the current restrictions on groundwater consumption, the groundwater cleanup is considered protective. While the overall site groundwater appears to meet the requirements of the 2004 ESD, residual contaminant concentrations in groundwater should be reevaluated prior to lifting groundwater restrictions to verify that there are no unacceptable risks to human health and to determine when restrictions on groundwater consumption can be lifted.

Concerns – None

Second Five-Year Review Report
for the
Cross Brothers Pail Recycling Superfund Site

I. Introduction

The purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is require, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted this Five-Year Review of the remedy implemented at the Cross Brothers Pail Recycling Superfund Site in Pembroke Township, Illinois. This review was conducted by the Remedial Project Manager for the site from March 2005 through August 2005. This report documents the results of the review and will become a part of the Site File.

This is the second Five-Year Review for the Cross Brothers Pail Recycling Superfund Site. The triggering action for this statutory review is the date of the first Five-Year Review report, August 31, 2000. The Five-Year Review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

TABLE 1
Chronology of Significant Site Events
Cross Brothers Pail Recycling Superfund Site

EVENT	DATE
Site Discovered by IEPA	June 1980
Proposed on NPL	August 19, 1982
Listed on NPL	September 8, 1983
RI/FS	May 1983 – June 1984
Interim ROD for Interim Remedial Measures	March 25, 1985
IRM Activities	1985
Additional Hydrogeological and Feasibility Studies	July 1989
ROD (to supplement IRM)	September 28, 1989
UAO issued to six PRPs	February 8, 1990
RD work plan for all work except PCBs	January 1991
RD work plan for PCB work approved	October 4, 1991
Confirmatory PCB work	December 1991 – March 1993
100% RD for groundwater work approved	September 21, 1993
ESD	May 10, 1994
RD for PCB work approved	September 28, 1994
Construction begins for groundwater work	May 10, 1995
RA work plan for PCB work approved	May 26, 1995
PCB soil work	July – November 1995
Referral to DOJ for enforcement of UAO	September 28, 1995
Pre-Final Inspection	February 8, 1996
Groundwater extraction system start-up	May 1996
PCOR	June 6, 1996
Institutional controls: - deed restrictions - site fence - start of long-term groundwater monitoring	 December 30, 1990 May 1995 & September 1995 January 1997
Final Inspection and O&M Start	December 8, 1998
Five-Year Review Site Inspection	June 7, 2000
Removal of GAC step from GW treatment	August 2000
Finalization of 1st Five-Year Review Report	August 31, 2000
Approval of Trial Shutdown Plan	December 22, 2000
Quarterly Groundwater Monitoring for Indicator Parameters	2001 -2003
Respondents submit Closure Petition	January 17, 2003
Groundwater and Residential Well Sampling with Full TAL/TCL Analyses	December 2003 – January 2004
ESD	September 28, 2004
Review / Revision of Risk Reassessment Report	September 2004 - current

III. Background

Physical Characteristics

The Cross Brothers Superfund Site (the Site) is approximately 20-acres in size and is located in Pembroke Township, near Momence, Illinois. The Site is situated within a semi-residential area interspersed with farm and undeveloped pastureland located 4 miles south of the Kankakee River. See Figure 1, "Site Location Map".

Land and Resource Use

James and Abner Cross (the Cross Brothers) owned and operated a pail and drum reclamation business at the Site from 1961 to 1980. The Site was and is privately owned. The property surrounding the original source areas and the groundwater treatment building is fenced. A son of one of the original Cross Brothers currently operates a pallet construction and reclamation business on the property surrounding the fenced area. Upon closure of the site, the current operator intends on moving his operation into areas that are available for use.

The current land use for the surrounding area is residential, commercial and agricultural. The area is subject to environmental justice considerations because of the racial profile of the community and depressed income levels.

History of Contamination

The Cross Brothers, with neighborhood kids working as assistants, would regularly drive business to business, collecting pails and 55-gallon drums for cleaning and resale. Empty pails and drums often were taken free of charge or for a fee of about $2.00 per barrel, if full, because containers were harder to lift and required disposal of the contents. The reclamation operation on the Cross Brothers' property consisted of placing drums and pails containing solvents, dye, ink, and paint residue on the ground and allowing the contents to drain directly into the ground. Waste solvents were then poured over the containers and ignited to dissolve the remaining residue. The drums and pails were then reconditioned (sandblasted and painted) for sale.

Initial Response

In June 1980, the Site was discovered by the Illinois Environmental Protection Agency (IEPA) through observation of an aerial survey. An inspection of the Site revealed that the reclamation operation had resulted in the deposition of a layer of waste residue up to 6 inches thick over an area approximately 10 acres in size. Numerous pails and drums were present at the Site. Additionally, trenches of various sizes were discovered throughout the Site.

Subsequently, the Illinois Attorney General's office obtained a court order from the Kankakee Circuit Court on August 19, 1980, requiring the Site to be cleaned up and closed. Subsequent to the court order, IEPA conducted a limited investigation to characterize the contamination at the Site. This investigation indicated the presence of surficial and buried waste materials (i.e., pails and drums) and groundwater contamination plume. Soil and groundwater at the Site was contaminated with PCBs, volatile organic compounds (VOCs) and heavy metals.

The Site was proposed on the national Priorities List (NPL) on August 19, 1982, and listed on the NPL on September 8, 1983.

Basis for Taking Action

From May 1983 until June 1984, the IEPA conducted a Remedial Investigation (RI)/ Feasibility Study (FS) at the Site through a cooperative agreement with the U.S. EPA. The focus was to locate additional waste areas, perform an inventory of items such as drums and accurately define the groundwater plume.

Concurrently, the court ruled that the Cross brothers could operate their pail and drum reclamation business (as long as the pails and drums contained no hazardous wastes) and begin a wood pallet reclamation operation at the Site.

Hazardous substances that were released at the site in each media include:

Soil	Groundwater
PCBs	isophorone
tetrachloroethene	acetone
total xylenes	benzene
2-butanone	1,2-dichloroethene (total)
c-1,3-dichloropropene	vinyl chloride
tichloroethene	chloromethane
toluene	methylene chloride
ethylbenzene	1,1-dichloroethene
2-methylnaphthalene	1,1-dichloroethane
isophorone	1,2-dichloroethane
naphthalene	chloroform
di-n-butylphalate	2-butanone
butylbenzylphthalate	1,1,1-trichloroethane
3,3'-dichlorobenzidene	trichloroethene
	toluene
	ethylbenzene
	total xylenes
	di-n-butylphthalate
	naphthalene
	2,4-dimethylphenol
	4-methylphenol
	benzyl alcohol
	2-methylnaphthalene
	benzoic acid
	pentachlorophenol

An evaluation of risks from exposure to site soils found that PCBs (with a maximum concentration of 110ppm) were the primary contributor to the increased lifetime cancer risk and increased hazard index (HI). The risk assessment further found that although volatile and semi-volatile organic compounds were detected in surface and subsurface soils, the hazard ratios and increased lifetime cancer risk

values calculated as part of the risk assessment show that volatile and semi-volatile organic compounds present a negligible risk to human health from direct contact. The presence of these compounds in soils, however, presented a continual risk to groundwater.

Contaminant distribution in the aquifer system is limited to the Kankakee aquifer. The general flow direction of the Kankakee aquifer is towards the north. Vinyl chloride. 1,1,-dichloroethene, and 1,2-dichloroethane were found at levels above MCLs. A risk evaluation of contaminants in groundwater found maximum and representative hazard indices of 33.49 and 2.59, respectively. Maximum and representative cumulative increased lifetime cancer risk values were estimated at $7.9x10^{-2}$ and $4.2x10^{-3}$, respectively. Residents in the area use private wells as a water source and the site contamination posed a potential threat to area residents who live downgradient of the source area.

IV. Remedial Actions

Remedy Selection

On March 25, 1985, U.S. EPA, with Illinois Environmental Protection Agency's (IEPA's) concurrence, signed an Interim Record of Decision (ROD) requiring certain initial remedial measures (IRM) be performed at the Site. Specifically, the IRM involved the removal of surficial and buried waste materials, as well as visibly contaminated soils. The ROD also recommended the investigation of soil and groundwater contamination be continued to determine if additional measures would be required.

In 1985, IEPA conducted the IRM activities. During the IRM, IEPA cleared the disposal areas of all vegetation, removed approximately 6,500 tons of contaminated surficial soil, 60 tons of crushed pails, 550 drums containing wastes and 580 empty drums. However, because further work was needed IEPA conducted Hydrogeological and Feasibility studies which were completed in July 1989. Numerous hazardous substances, primarily volatile and semi-volatile organic compounds, were detected in samples of groundwater from the aquifer and subsurface soils underlying the Site.

Several private wells were located approximately 1,250 feet north of the Site and contaminated groundwater was found to be 750 feet north of the Site. Based upon advancement of the plume, it was estimated the wells would be contaminated within 5 years. Based upon the results of local private water supply sampling, two homeowners north of the Site were advised by IEPA to obtain an alternate source of water. Mr. Cross provided them with deeper wells.

A ROD to supplement the earlier decision document for the IRM was signed by U.S. EPA on September 28, 1989. The final remedy requires remediation of groundwater and soil contamination to provide for the protection of public health, welfare and the environment. The ROD documents two remedial action elements: one remedial action (RA) element of remediation of the localized PCB-contaminated soils and the other is remediation of VOC-contamination soils and groundwater.

The major components of the selected remedy were, as follows:

1. Re-sampling of the localized PCB soil area to identify the existence of a PCB source area;
2. Excavation of the localized PCB-contaminated soil areas and incineration of the soils at a TSCA approved incinerator;

3. Installing and maintaining a groundwater collection system capable of capturing the groundwater contaminant plume and a groundwater treatment facility to remove contaminants from the collected groundwater;
4. Installing and maintaining a soil flushing system for the 3.5 acres of contaminated soil within the disposal area as an enhancement of the groundwater pump and treat system;
5. Installing and maintaining a 6-inch vegetative cover over that portion of the disposal area not subject to the soil flushing operation;
6. Installing and maintaining a 6-inch vegetative cover over that 3.5 acres subject to soil flushing upon termination of the soil flushing operations;
7. Installing and maintaining a fence around the site during remedial activities;
8. Installing a deed notification identifying U.S. EPA and IEPA concerns regarding any intrusive activities to be conducted at the Site; and
9. Monitoring of the groundwater collection/treatment system and groundwater contaminant plume during groundwater remediation activities.

An Explanation of Significant Differences (ESD) was issued on May 10, 1994. The ESD was initiated after the ROD was signed because information became available which allowed U.S. EPA to further refine the selected remedy. Specifically, the significant difference addressed in the ESD concerned the remediation of the PCB contaminated soil area. The 1989 ROD required resampling of the PCB area to confirm the presence of a PCB source. If the samples showed soils to be contaminated above 10ppm, then RA activities would be conducted on those soils. The FS and 1989 ROD detailed two options:

OPTION 1	OPTION 2
PCB soil removal and Incineration	PCB Soil Removal and Land Filling
* ($17,700)	* ($9,600)

* Estimated cost based on 5 cubic yards

Since it was estimated that only 5 cubic yards of soil contaminated with PCB concentrations above 10ppm might be involved, Option 1 was chosen for the 1989 ROD because the volume was small enough to incinerate without an unreasonable use of resources. However, based on investigations conducted during the remedial design (RD) phase, U.S. EPA concluded that the contaminated soil volume was closer to 210 cubic yards in volume, or more than 40 times the soil volume originally estimated in the 1989 ROD. Incineration capacity is limited and the cost is prohibitive. As a result, U.S. EPA made the decision in the 1994 ESD that soils with PCB contamination between 10ppm and 50ppm would be land filled in an approved facility. Soils containing PCBs at concentrations equal to or greater than 50ppm would still be incinerated. Thus, the remedy implemented was a combination of Options 1 and 2.

During the O&M phase of the project in 2004, when the system had ceased operation as part of a trial shutdown, U.S. EPA evaluated system performance and the requirements of the remedy. From this review, U.S. EPA determined that additional modifications of the original ROD were necessary. The original ROD criteria for completion of the cleanup required the Site groundwater to meet MCLs and to also meet a cumulative carcinogenic risk level of at or below $1x10^{-6}$ and a non-carcinogenic hazard index no greater than 1. The carcinogenic standard of $1x10^{-6}$ cumulative risk is much more conservative than is required in water supplies across the country. This issue had been discussed by the Respondents and U.S. EPA during the Remedial Design phase of the project. At that time, the

U.S. EPA Remedial Project Manager had approved the Respondents' proposal that the groundwater treatment system be designed to meet MCLs, with the cumulative risk requirement of the ROD only to be applied for those contaminants without MCLs. While this realignment of the cleanup endpoints was technically acceptable, it had never been documented as a modification of the ROD. An ESD, dated September 28, 2005, (the second for this Site) was therefore prepared to document and explain the rationale for updating the cleanup criteria to make the endpoints consistent with current practice.

In addition to evaluating the technical requirements of the ROD, the review of remedy requirements had identified a shortcoming with regard to the institutional controls required after cleanup is complete. There was a requirement for a soil cover, but the long-term maintenance of the cover was not justified. There was a requirement that the landowner notify U.S. EPA of intrusive activities and anything unusual identified, but no discussion of what would be done or whether development was acceptable. The ESD therefore also clarified the requirements of post-cleanup institutional controls.

This second Site ESD made the following changes to the cleanup requirements at the site:

1. Contaminant levels in groundwater at the Site may not exceed MCLs.
2. Cumulative risk from consumption of groundwater contaminants that do not have MCLs may not exceed 1×10^{-5}.
3. Land use in historical source areas is restricted to commercial and/or industrial uses as a precautionary measure due to the extent of past waste disposal in the area and the possibility that a future user might encounter a pocket of waste material not identified during the investigation or site cleanup.
4. The remainder of the site has no restrictions on development.

Remedy Implementation - General

A Unilateral Order (UAO) was issued on February 8, 1990, to six Potentially Responsible Parties (PRPs or Respondents) to perform the remedy outlined in the ROD. The six Respondents are James Cross (owner and operator), Sherwin-Williams Company (generator), Glidden/SCM Corporation (generator), Frederick H. Levey Company, Inc., (generator), Inmont Corporation (generator) and Specialty Coatings Company, Inc. (generator). In general, the remedial activities were conducted as planned. Significant modifications for the PCB soil area are documented in an ESD signed by U.S. EPA on May 1994.

Remedy Implementation - Groundwater Components of the Remedial Action

The respondents submitted a RD Work Plan for all work except the localized PCB removal (discussed below in Section C.4.) in January 1991. The RD was submitted in June 1993 and the 100% RD was approved by U.S. EPA on September 21, 1993. However, the groundwater and system influent/effluent monitoring Quality Assurance Project Plan (QAPP) and Sampling and Analysis Plan portion of the RD dated June 15, 1993 were approved in June 1993.

The primary components of the approved RD included:

1. Groundwater extraction wells;
2. Air strippers, with clearwells beneath;
3. Bag filters;
4. Granular activated carbon (GAC) cells, 2 in a lead/lag series;

5. Land application / soil flushing area, to receive part of the treated water;
6. Groundwater injection wells, to receive the balance of the treated water;
7. Groundwater and treatment system monitoring; and
8. Vegetative cover.

Construction work at the Site did not begin until May 10, 1995. In accordance with the UAO, the Respondents were required to begin RA work 115 calendar days after approval of the 100% RD submittal, which should have been January 14, 1994. Under that schedule, it is estimated that the RA work would have been completed by October 1994. However, just three weeks prior to the start date in December 1993, the Respondents submitted a Petition to Amend the 1989 ROD on the basis that the projected cost of the selected remedy had increased by approximately 100% and argued for another type of remedy. Also, the petition requested a 90-day stay on the running of the 115-day period at the end of which remedy implementation had to begin. On January 28, 1994, U.S. EPA rejected the petition, noting that the technologies considered in the petition had been previously considered by U.S. EPA. Furthermore, U.S. EPA noted that it had taken 4 years for the design of the selected remedy to be developed and accepted by all parties and for the Respondents to retain a construction contractor. The U.S. EPA also disagreed with the Respondents' cost estimates and the projected time to complete the cleanup.

As a result of the Respondents' delays as described above, on September 28, 1995, the U.S. EPA referred the matter to the U.S. Department of Justice (DOJ) for enforcement regarding the Site. U.S. EPA cited the Respondents' failure to comply with the RA start-up date indicated in the UAO, among other issues. The referral suggested that civil, punitive, and CERCLA response costs are appropriate. U.S. EPA and DOJ are currently in negotiations with the Respondents to settle issues related to penalties and past costs.

The Respondents started planning construction activities in the fall of 1994. U.S. EPA and the Respondents held a pre-construction meeting on May 1, 1995. The Respondents began construction mobilization activities for the RA including Site clearing, earth working, fence installation, and creation of access roads during the week of May 8, 1995.

Construction of the groundwater treatment system began in the month of July 1995. Initial startup of the groundwater extraction system was in May 1996.

The groundwater remediation system was designed and built to contain the migration of the contaminant plume, extract contaminated groundwater at the Site to the cleanup criteria established by the ROD, reduce the concentration of volatile and semi-volatile target organic compounds in the extracted groundwater to meet specified effluent criteria, and return the treated water to the groundwater system through injection wells.

In the groundwater treatment system, groundwater is extracted by two lines of down-gradient extraction wells referred to as the "Northern Extraction Well Line" and the "Southern Extraction Well Line" (see Figure 2, "Site Features Map" – attached) via a vacuum assist suction pump (VASP) located inside the treatment building. The Northern Extraction Well Line consists of twelve (12) extraction wells installed along an east-west line and positioned in front of the leading edge of the contaminant plume (about 1100 feet north of the main source area / soil flushing zone) to contain and cleanup down-gradient groundwater contamination. The Southern Extraction Well Line consists of six

(6) extraction wells installed mainly along an east-west line and positioned near (about 70 feet north) of the main contaminant source area/soil flushing zone.

The contaminated groundwater is conveyed to the VASP through a subgrade pipeline and pumped to the treatment system. The treatment system is comprised of (in order in the treatment train) air stripping towers (one operating at a time), bag filtration and carbon adsorption (see Figure 3, "Groundwater Treatment Plant). On August 22, 2000, the U.S. EPA approved of the removal of the carbon adsorption treatment step in the treatment process. This modification is discussed further in Section D, "System Operation" of this report.

About two-thirds of the treated groundwater is discharged to two lines of injection wells referred to as the "Northern Injection Well Line" and the "Southern Injection Well Line". The Northern Injection Well Line consists of thirteen (13) injection wells located just north of (122 feet downgradient) and parallel to the Northern Extraction Well Line. The Southern Injection Well Line consists of five (5) injection wells and is located just north (65 feet down gradient) and parallel to the Southern Extraction Well Line.

The groundwater remediation also serves to remediate the soil via soil flushing. This system was designed and built to establish a "cleaning loop". About 1/3 of the treated groundwater is either spray applied (i.e., sprinklers) during the summer to the 3.5 acre contaminated soil area that contains contamination throughout the unsaturated zone ("soil flushing area"), or during the winter, injected into four (4) wells (referred to as "Seasonal Injection Wells) up-gradient of the soil flushing area (see Figure 2, "Site Features Map" – attached). The remaining treated effluent is injected into the Northern and Southern Injection Well Lines.

The groundwater treatment was to continue until analyses consistently indicated that the groundwater cleanup objectives have been met. The original groundwater cleanup objectives of the ROD were that the area groundwater was to meet currently promulgated MCLs and not exceed a cumulative excess lifetime cancer risk not exceeding $1x10^{-6}$. It was originally estimated that it would take approximately 15-20 years to achieve the groundwater objectives. The original ROD criteria can be found in Table 3 of the ROD.

A punch list of items to be completed was developed by the Respondents, their contracting engineer, in cooperation with the U.S. EPA, and submitted to the U.S. EPA on February 22, 1996 as part of the Pre-Final Inspection Report. Most of the punch list tasks were relatively minor (e.g., seeding, completion of walkways, electrical completion, installation of several wells, and labeling of wells). These punch list items were completed by December 1998.

Remedy Implementation - Vegetative Cover Components of the Remedial Action

The ROD requires that a vegetative cover be placed over an approximately 10-acre section of the Site (i.e., the area within the perimeter fence and not within the soil flushing zone). The vegetative cover was placed over the area within the perimeter fence by December 1998, and is currently considered established. The cover included grading of the area, topsoil with a thickness of 6 inches and vegetative seeding.

In anticipation of a hoped-for site closure, Respondents installed the soil cover over the soil flushing area in spring of 2005. The cover was hydroseeded in July 2005, but as of the date of this report, the

vegetative cover is not yet fully established. Weeds cover much of the area, but sufficient rain has not been received to germinate the grass seed. Note that the Respondents performed this soil closure activity "at risk" with the understanding that they have not received permission from U.S. EPA for site closure.

Remedy Implementation - Institutional Controls

The ROD requires that institutional controls be implemented at the Site. Pursuant to the ROD, these controls include securing the Site by placing a security fence around the Site, obtaining deed restrictions, and performing long-term groundwater monitoring.

On December 30, 1990, James Cross executed the Declaration of Covenants, Conditions, Restrictions and Easements ("Declaration") regarding the Cross Brothers property. The Declaration was recorded on March 20, 1991. The Declaration prohibited the then current owner, James Cross, and any future owners, from use of the source areas (see Figure 4), contained within Lots 19 and 20 as described in the legal description at Exhibit A to the Declaration, that could interfere with the remedy. The Declaration prohibits residential, agricultural and industrial uses, and prohibits the extraction or use of groundwater. The Declaration gives U.S. EPA and the state the right to access the site to monitor compliance and enforce the use restrictions provided in the Declaration. The Respondents placed a fence around the site to restrict access during May 1995 and it was expanded in September 1995. Specifically, a site security fence was constructed around the treatment building, soil flushing area, portions of the southern extraction and injection system, and the vegetative cover. In addition, certain wells were enclosed in a separate security fence as an extra precaution to protect elements of the system constructed outside of the Site security fence. On January 21, 1999, the Respondents submitted a report to U.S. EPA verifying that the required deed restrictions have been made for the Site.

Since the issuance of the second site ESD in 2004, the requirements for post-cleanup institutional controls have been clarified to permit commercial and/or industrial uses, and the current owner or future owners may submit a revised Declaration to U.S. EPA for approval to permit such uses.

Remedy Implementation - PCB Soil Removal

The PCB-contaminated soils area was designated as one RA element in the ROD. The ROD presented a PCB cleanup requirement of 10ppm in soils for unrestricted use. In addition, the 1994 ESD required that soils with PCB contamination between 10ppm and 50ppm be land filled in an approved facility. Soils with PCB concentrations equal to or greater than 50ppm were to be incinerated.

The Respondents submitted a RD Work Plan for PCB soil removal in September 1991. The RD Work Plan for PCB removal was approved by U.S. EPA on October 4, 1991. Confirmatory sampling work was conducted between December 1991 and March 1993. The PCB RD Localized PCB Soil Removal Plan (The PCB RD) was submitted by the Respondents in May 1994. The PCB RD was approved on September 1994. The Respondents submitted a RA Work Plan for PCB soil removal on January 11, 1995, which was approved by U.S. EPA on May 26, 1995.

The Respondents completed the PCB excavation during July and August 1995 and backfilled the area in September 1995. Specifically, between July 24 and August 4, 1995, about 250 cubic yards of soil contaminated with PCB concentrations less than 50ppm and 25.54 tons of soil contaminated with PCB

concentrations greater than 50ppm were excavated. On October 30, 1995, the 25.54 tons of soil contaminated with PCB concentrations at or greater than 50ppm were transported to APTUS, Aragonite, Utah for final disposition by incineration. On November 14 and 17, 1995, the 250 cubic yards of soil contaminated with less than 50ppm were transported o the Kankakee Industrial Disposal facility in Chebanse, Illinois. The Final PCB RA Report was received by U.S. EPA in March 1996.

Remedy Implementation - Construction Completion

A construction completion Pre-Final Inspection for the entire Site was conducted by the U.S. EPA Remedial Project Manager (RPM) on February 8, 1996. A Pre-Final Inspection report was submitted to U.S. EPA on February 22, 1996, by the Respondent and included the required list of items to be completed before the Final Inspection. The Pre-Final Inspection report was approved with modifications on March 21, 1996.

U.S. EPA completed a Preliminary Closeout Report (PCOR) on June 6, 1996, to document construction completion.

A Final Inspection of construction activities and punch list items for the entire Site was conducted by the U.S. EPA RPM on December 8, 1998 and documented in a Final Inspection Report letter, which was submitted by the Respondents to U.S. EPA on January 4, 1999.

System Operations/Operation and Maintenance (O&M)

A long-term groundwater and system influent/effluent monitoring plan was included as part of the 100% Remedial Design. The long-term monitoring plan portion of the RD included a QAPP and a Sampling and Analysis Plan (June 1993). A RA Implementation Report (construction completion report), which includes as-built drawings, was submitted by the Respondents and approved by the U.S. EPA on January 6, 1999. An O&M plan for the pump and treat system was submitted and approved in July 1999.

The system startup activities were conducted in accordance with the approved RD Plan. The initial startup activities were conducted on May 15 through May 17, 1996. Since that time, the system operated on a relatively consistent basis with intermittent shutdowns for system maintenance, adjustment and corrections to ensure proper function. Based on the most current monthly progress report from the Respondents, the total influent flow rate from the extraction system was approximately 200 gallons per minute (gpm) while the system was in operation.

Throughout the system startup activities, the Respondents performed sampling from selected influent, midstream and effluent points of the system to assess removal efficiency and ensure compliance with the regulatory effluent limits. The analytical results of these sampling efforts were submitted to U.S. EPA.

As part of the O&M for the system, routine groundwater sampling of existing compliance monitoring wells and system influent/effluent commenced in January 1997. The results of the quarterly sampling efforts were submitted to the U.S. EPA as part of the Respondents' monthly progress reports.

On August 10, 2000, the Respondents submitted a proposal to U.S. EPA for the discontinuation of the carbon adsorption, referred to as granular activated carbon (GAC), treatment step in the treatment

system at the Site. On August 22, 2000, the U.S. EPA approved of this proposal. The GAC was included in the treatment system to remove organic compounds that may be present above effluent criteria in the discharge from the air stripper. Three years of monitoring data had shown that the air stripper effluent was consistently below effluent and cleanup criteria, with the exception of bis-2-ehtylhexyl phthalate (BEHP). BEHP was believed to be a laboratory artifact. In summary, the GAC cells are not necessary in order to eliminate organic compounds in compliance with the UAO requirements. Progress and results of GAC cell removal from the treatment train were communicated to the RPM in monthly progress reports.

V. Progress Since Last Five Year Review

The first Five-Year Review was signed in August of 2000. Since that time, the focus of site work has been to evaluate the site for possible closure. In December 2000, the Respondents requested a trial shutdown of the system based on the fact that routine monitoring showed the influent was consistently meeting effluent requirements and cleanup criteria. Since incoming water already met standards prior to treatment (based on routine analysis for indicator parameters), U.S. EPA approved of the trial shutdown on December 22, 2000.

The Respondents submitted a closure petition and a draft plan for site closure on January 17, 2003. However U.S. EPA took no action on the Plan for Site Closure because before site closure could be approved, the Respondents were required to prepare a reevaluation of site risks to ensure that residual groundwater contamination met the requirements of the ROD, as modified by the 2004 ESD. After U.S. EPA approval of the Trial Shutdown, quarterly groundwater monitoring continued for 2 years, with analyses for a specified list of indicator parameters. No significant spikes in groundwater contaminant concentrations were seen. See Table 2 for a summary of quarterly monitoring results during Trial Shutdown.

Assessment of On-Site and Residential Groundwater

In evaluating data available to assess residual risk, U.S. EPA determined that the list of indicator parameters used during quarterly monitoring to evaluate the extent of contamination was insufficient to determine whether ROD criteria had been met. In addition, U.S. EPA became concerned about a Tentatively Identified Compound (3,3,5-trimethylcyclohexanone) that had been routinely seen in quarterly data packages. Therefore, U.S. EPA required a complete round of groundwater sampling, analyzing for a full list of parameters (VOCs, semi-volatile and inorganics) with quantification of 3,3,5-trimethylcyclohexanone. For efficiency in moving forward with the sampling under an approved QAPP, U.S. EPA performed the inorganic sampling (TAL metals plus mercury and cyanide) through its START contract. The Respondents conducted the VOC and SVOC analyses and modified their QAPP to add a method for quantification of 3,3,5-trimthylcyclohexanone. In addition to the site monitoring wells, three downgradient residential wells were also to be evaluated to ensure that no unacceptable off-site risks were present. The sampling of Site monitoring wells was performed in December 2003. Residential wells were sampled in January 2004.

Monitoring Data / Risk Reassessment

The results of inorganic analyses from the December 2003/January 2004 groundwater sampling event are presented in Table 2 (attached). The locations and concentrations of organic (VOC, SVOC and

pesticides/PCBs) groundwater contaminant detections can be viewed in Figures 6 through 8. This data has been used in conjunction with previous quarterly monitoring for the preparation of the draft Risk Reassessment Report. A second draft of the Respondents' Risk Reassessment Report is currently under review by U.S. EPA.

The monitoring data and draft Risk Reassessment identified potential concerns with the following contaminants:

3,3,5-Trimethylcyclohexanone - A plume of 3,3,5-trimethylcyclohexanone has been identified at the Site (See Figure 5). 3,3,5-trimethylcyclohexanone does not have established reference dose or slope factor standards. Therefore, Region 5 turned to U.S. EPA's National Risk Management Research Laboratory (NRMRL) in Cincinnati for a recommendation on an appropriate surrogate. NRMRL researchers reviewed the molecular structure and characteristics of 3,3,5-trimethylcyclohexanone and ultimately recommended that the reference dose for isophorone (also a site contaminant of concern) be used for the 3,3,5-trimethylcyclohexanone non-cancer risk calculations. For a slope factor, U.S. EPA's Office of Research and Development recommended that isophorone be used as a surrogate for 3,3,5-trimethylcyclohexanone in calculations of carcinogenic risk. The use of isophorone as a surrogate allows U.S. EPA and the Respondents to conservatively approximate risk for this site-related contaminant whose contribution to the overall groundwater consumption risk would otherwise be addressed only qualitatively. Based on preliminary estimates it appears that on its own, the 3,3,5-trimethylcyclohexanone in Site groundwater presents a risk that does not exceed $1x10^{-5}$. However, since cumulative risk is of concern for comparison to ROD/ESD criteria, the presence of 3,3,5-trimethylcyclohexanone has not yet been ruled out as a potential source of unacceptable human health risk.

Beryllium - The results of the monitoring have shown a single MCL exceedance of 5.3ppb of Beryllium at monitoring well MW-104. The Respondents' split sample from the well was found to contain 5.2 ppb beryllium. The MCL for beryllium is 4ppb. Beryllium had not previously been identified a contaminant of concern at the site.

Arsenic – Results of the Respondents' split sample from MW-108 identified the detection of arsenic at 11ppb. A duplicate sample taken at the same time at the same well found the level to be approximately 8.4ppb (the data point was "J" qualified). U.S. EPA's analysis of the groundwater from MW-108 did not identify arsenic, but the method detection limit of 15ppb was too high to identify arsenic at the concentrations identified by the Respondents. As of the date of the original 1989 ROD, the MCL for arsenic was 50ppb. As of the date of the 2004 ESD, the MCL for arsenic had been lowered to 10ppb. Arsenic had not previously been identified as a contaminant of concern at the site.

Iron - Iron has been found to be elevated above background in several monitoring wells. Iron was seen as high as 9420ppb in well M3. While not a carcinogenic risk, the Risk Reassessment Report has shown that iron does raise the Hazard Index slightly above 1 at wells M3 and MW-108.

Aniline - Aniline has been found consistently in monitoring well NE-10 at concentrations as high as 129ppb, but not at upgradient wells within the impacted area evaluated as part of the RI. The draft Risk Recalculation Report estimates that the carcinogenic risk at well NE-10 as

$1.3x10^{-5}$, primarily due to the presence of aniline. Based on an evaluation of confirmed detections and a review of tentatively identified compounds seen during past monitoring events, the Respondents have raised the possibility that the pattern of detections suggest a possible source area not previously identified. Because this area of potential contamination is outside of the original site area, the area was sampled by the Region 5 Emergency Response Division in August of 2005. Preliminary results from soil sampling show no detections of aniline.

Site Closure Activities

The Respondents have moved forward with some site closure activities in anticipation of a positive response from U.S. EPA on the Risk Reassessment report documenting that they have met the requirements of the ROD, as modified by the two Site ESDs. These closure activities were performed "at risk" by the Respondents meaning that U.S. EPA will not prevent them from commencing shutdown activities, although U.S. EPA has not approved the Risk Reassessment or approved the Plan for Site Closure. In taking these actions in advance of an approval, Respondents take on the risk of needing to reinstall equipment should the treatment system need to be restarted. Respondents have removed much of the equipment from the treatment building (this equipment had been idle since the trial shutdown was approved in December 2000). As previously noted, the Respondents have also placed the soil cover on the soil flushing area and hydroseeded.

It is anticipated that the Respondents will seek the approval of property owners to leave the extraction pipes in the ground once the Site Closure is approved. The fence and building will remain at the Site and be available for use by the Mr. Cross, the site owner who currently operates his pallet construction company just outside of the fenced remedial action area.

VI. Five-Year Review Process

Administrative Components

In a letter dated February 22, 2005, the U.S. EPA notified the Illinois EPA of the commencement of the Five-Year Review for the Cross Brothers Pail Recycling Site. The review was performed by the Site RPM, Ms. Terese Van Donsel. Ms. Van Donsel consulted with Mr. Oliver Warnsley, the Environmental Justice Coordinator for the Region 5 Superfund Division.

Community Involvement

A notice advertising the start of the Five-Year Review was placed in the largest area paper (the Kankakee Daily Journal) on April 11, 2005. There had historically been limited public interest in the site and a decision was made not to hold a public meeting for the Five-Year Review. Instead, a public meeting would be held in advance of site closure. Based on input from another newspaper about circulation in the African-American community in Pembroke Township, it was determined that future notices should be better targeted to local residents.

Document Review

This Five-Year Review consisted of a review of relevant documents including the ROD, the 2004 ESD, the PCOR, the first Five-Year Review Report, monthly progress reports, groundwater monitoring results and the draft Risk Reassessment Report.

Data Review

This Five-Year Review focused on groundwater data generated since the commencement of the Trial Shutdown in 2000. Residual contaminant concentrations were evaluated against the criteria in the 2004 ESD to ensure that the remedy is protective and to evaluate whether residual contaminant concentrations are low enough to warrant permanent system shutdown.

Site Inspection

A Five-Year Review site inspection was conducted by the RPM on July 8, 2005. The purpose of the inspection was to assess the protectiveness of the remedy. No significant issues were identified regarding the condition of the site. The fencing was in place and in good order. The soil cover had been adequately placed and hydroseeded, and was on its way to becoming vegetated. Institutional controls are in place to restrict use of the fenced area, and no activities were observed that would have violated institutional controls.

During the site inspection, the RPM discussed concerns that had been raised by the PRPs regarding a possible aniline source area to the north of the fenced area. Aerial photos were reviewed which showed historical activity apparently connected to a trailer to the west of the NE-10 well and activity which could be connected to later Cross Brothers activities. At this time, the soil area around NE-10 is not considered to be part of the Cross Brothers Site. In August 2005, the U.S. EPA Region 5 Emergency Response Division collected soil samples from the area in question to determine whether an aniline source area is present. Preliminary results show no detections of aniline

Interviews

No community interviews were conducted as part of the Five-Year Review process.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. While operational, the remedy complied with the performance standards presented in the ROD as modified by the 1994 ESD. The groundwater monitoring results will be evaluated against the cleanup criteria as updated by the 2004 ESD before Site closure will be approved. These standards and criteria remain protective of human health and the environment.

The institutional controls that are in place restrict residential and agricultural use of the fenced area that includes the historical source areas and prohibits the extraction or use of groundwater from the source areas. No activities were observed that would have violated the institutional controls.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

No. The exposure assumptions and toxicity data have been reevaluated and updated, as necessary with recent RAGS guidance, as part of the risk reassessment process for evaluation of site closure. The risk reassessment process was made more conservative with the evaluation of 3,3,5-trimethylcyclohexanone, using isophorone as a surrogate. The 2004 ESD also modified the cleanup levels and endpoints by requiring that the cumulative risk from consumption of groundwater contaminants that do not have MCLs may not exceed 1×10^{-5}. The Applicable or Relevant and Appropriate Requirements (ARARs) identified in the ROD for this Site are protective of human health and the environment.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. U.S. EPA believes that it is appropriate to move toward site closure. As discussed previously, the soil area near well NE-10 that was highlighted by the Site PRPs as a possible contaminant source area is outside the original bounds of the Cross Brothers Site. At this point, it has not yet been linked to the Cross Brothers site and data is not available to determine whether there is an actual risk or not. The area will be evaluated by the Region 5 Emergency Response Division.

VIII. Issues

Issues identified and evaluated as part of the review are, as follows:

3,3,5-Trimethylcyclohexanone - Based on the draft Risk Reassessment Report, the plume of 3,3,5-trimethylcyclohexanone at the site does not appear to present a carcinogenic or noncarcinogenic risk that exceeds the limits established by the ROD, as modified by the 2004 ESD. The use of isophorone as a surrogate for the carcinogenic and non-carcinogenic risk calculations was thought to be an appropriate and conservative approach to evaluate risk for this routinely identified Site contaminant.

Although the 3,3,5-trimethylcyclohexanone plume itself does not appear to exceed the ESD established criteria of 1×10^{-5} for residual carcinogenic risk, the evaluation of its significance will not be complete until the Risk Reassessment Report is finalized and total risks can be evaluated. At this point in time, it does not appear to warrant a determination that the cleanup is not protective of human health, even if the land use would change and institutional controls would allow residential use of groundwater.

Beryllium – The detection of beryllium in MW-104 is problematic in that the contaminant was never identified as a contaminant of concern. Based on historical sampling (monitoring events during 1987 and 1988), it was found that there were no valid detections of beryllium and determined that beryllium was not present at the Site. Up until the complete round of sampling and analyses required by U.S. EPA to evaluate the appropriateness of Site closure, routine sampling at the site was limited to indicator parameters and excluded inorganics.

Because current groundwater use is restricted, this review finds that the cleanup is currently protective of human health. However, the need for future restrictions on groundwater use in the area of MW-104 will need to be considered during the Site closure process. The significance of the single beryllium MCL exceedance should be considered as the monitoring results are compared to the 2004 ESD cleanup criteria and groundwater in the area of MW-104 should be resampled to reevaluate the issue prior to the lifting of groundwater use restrictions.

Arsenic – Arsenic was not historically a contaminant of concern at the site and the detection of arsenic at a concentration slightly above the MCL at MW-108 is not definitive.

With the current groundwater restrictions in place at the Site, the cleanup is currently protective. However, to err on the side of protectiveness, the MCL exceedance at MW-108 should be reevaluated prior to the next Five-Year Review to determine whether it is appropriate to lift groundwater use restrictions.

Iron - Iron has been found to be elevated above background in several monitoring wells. While not a carcinogenic risk, the draft Risk Reassessment Report iron does raise the Hazard Index slightly above 1 at monitoring wells MW-M3 and MW-108 and in an off-Site residential well.

Based on the calculations in the draft Risk Reassessment Report, this review finds that that there is no cause to question the protectiveness of the cleanup based on the elevated concentrations of iron.

Aniline - The possible presence of an aniline source in soils near NE-10 presented the only significant concern evaluated as part of this Five-Year Review. While the carcinogenic risk estimated from residential consumption of groundwater at NE-10 is not significantly above the criteria established in the 2004 ESD ($1.3x10^{-5}$ compared to the $1x10^{-5}$ cleanup criteria), there was no corresponding historical soil data from the Respondents' hypothesized aniline source area. The location of NE-10 is outside of the area of the remedial investigation, but in an area of possible historical waste consolidation. To resolve the issue, the hypothesized source area was sampled by the U.S. EPA Region 5 Emergency Response Division in August 2005. Preliminary results from the soil samples show no detections of aniline.

With the current groundwater use restrictions in place for the area around NE-10, the groundwater cleanup is currently considered to be protective. Whether the estimated $1.3x10^{-5}$ carcinogenic risk from possible future residential use of groundwater at NE-10 is sufficiently close to the 2004 ESD criteria to be acceptable will be considered during the site closure evaluation. In concert with that evaluation, U.S. EPA will determine the need to continue groundwater use restrictions past the time of site closure.

IX. Recommendations and Follow-up Actions

It is recommended that downgradient residential wells and a subset of Site wells be re-sampled prior to the next Five-Year Review to ensure that residential wells remain safe and to determine whether and when it is appropriate to lift groundwater use restrictions at the Site.

The groundwater treatment system at the Site has not been in operation for nearly five years, and residual levels of contaminants in groundwater across the Site appear to meet the requirements of the ROD, as modified by the 2004 ESD. It is therefore recommended that the closure of the groundwater treatment system should be made permanent. The single, localized MCL exceedance of beryllium and the possible arsenic MCL exceedance should be re-checked and reevaluated prior to the lifting of the groundwater use restrictions, but additional groundwater treatment with the current treatment system is not warranted to address these two contaminants. The presence of aniline at NE-10 appears not be related to the primary source area addressed in the RI and the ROD, but should also be monitored before water use restrictions are lifted. The carcinogenic risk from residential use of groundwater at NE-10 is the highest found at the Site ($1.3x10^{-5}$), but is basically consistent with the upper bound established in the 2004 ESD of $1x10^{-5}$. The air stripping remedy selected in the ROD would not be effective for aniline removal. Should treatment of aniline in groundwater be required at some time in the future, an alternate method, likely utilizing oxidation, would be necessary. For these reasons, it is recommended that the groundwater treatment system be closed and that periodic groundwater monitoring be undertaken to ensure the acceptability of residual groundwater contaminant concentrations prior to the elimination of groundwater use restrictions.

Recommendations / Follow-Up Actions	Responsible Entity	Oversight Party	Deadline
Sampling of Off-Site Residential Wells and Site Monitoring Wells – Data to be used for evaluation of groundwater use restrictions and to verify that off-site wells remain safe.	U.S. EPA Region 5	U.S. EPA Region 5	No later than December 2009. Additional sampling will be dependant on results of groundwater monitoring.
Finalization of Closure Report - to document work completed at site and an institutional control plan, including title commitment, to evaluate existing controls and implement any future institutional control requirements.	PRPs	U.S. EPA Region 5	April 30, 2006

X. Protectiveness Statements

I certify that the remedies selected for this Site remain protective of human health and the environment under current conditions.

The cleanup is currently considered protective. Based on the RI data and documentation of the removal of PCB-contaminated soils, there are no remaining soil concerns at the Site. However, since the Site investigation could not sample every area where waste could have been dumped, land use restrictions currently prohibit access to the historic source areas and address concerns about any residual pockets of contamination that were not seen during the investigation. Long-term protectiveness requires compliance with the land use restrictions on residential and agricultural development in the source areas. With the current restrictions on groundwater consumption, the groundwater cleanup is considered protective. While the overall site groundwater appears to meet the

requirements of the 2004 ESD, residual contaminant concentrations in groundwater should be reevaluated prior to lifting groundwater restrictions to verify that there are no unacceptable risks to human health.

The RD and RA construction management activities at the Site were conducted by the Respondents' construction quality assurance engineer pursuant to the construction Quality Assurance Plan under the oversight of IEPA's and U.S. EPA's Project Managers. The components of the RA were constructed by contractors and sub-contractors to the Respondents. All design and monitoring plans were approved by U.S. EPA.

XI. Next Review

The next Five-Year Review will be conducted five years from the date of this review.

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Organic Analytes
All concentrations are in parts per billion (ug/L).

#285 20AUG05
by BAP ck RMB/rsh app RDH

KEY: < = less than reporting limit, J = estimated, T = tentatively identified compound (TIC), nd = TIC not detected, na = not analyzed

Analyte	Well	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Dec-03
Methylene chloride	MW-101	<0.5	<0.5	<0.5	<0.5	0.39J	<0.5	<0.5	<0.5	<0.5
	MW-105	<0.5	<0.5	<0.5	<0.5	0.69	<0.5	<0.5	<0.5	<0.5
	MW-106	<0.5	<0.5	<0.5	<0.5	0.46J	<0.5	<0.5	<0.5	<0.5
	NE-3	<0.5	<0.5	<0.5	<0.5	0.45J	<0.5	<0.5	<0.5	<0.5
335-TMCHN	MW-102	nd	8T	nd	nd	12T	nd	35T	52T	40
	MW-103	nd	74T	14T	nd	76T	16T	94T	110T	42
	MW-104	nd	17T	2T	nd	57T	57T	64T	76T	39
	MW-107a	nd	nd	nd	nd	nd	140T	nd	nd	<5.0
	MW-107b	na	na	na	na	na	na	na	na	<5.0
	MW-108a	170.0T	nd	nd	84T	87T	270T	130T	nd	160
	MW-108b	210.0T	300T	440T	140T	84T	nd	160T	nd	130
	MW-108c	na	230T	240T	68T	59T	nd	210T	62T	na
	MW-108d	na	na	na	na	320T	600T	na	na	na
	MW-108e	na	na	na	na	na	nd	na	na	na
	NE-10a	170.0T	nd	300T	81T	180	nd	260T	nd	350
	NE-10b	na	na	nd	85	170	140T	210T	nd	300
Diethyl phthalate	MW-106a	<5.0	<5.0	<5.0	<5.0	<5.0	2.5J	<5.0	<5.0	<5.0
	MW-106b	na	na	na	na	na	na	<5.0	na	na
1,2,3-Trichlorobenzene	MW-105	nd	nd	nd	nd	nd	nd	nd	nd	0.49J
1,2,4-Trichlorobenzene	MW-105	nd	nd	nd	nd	nd	nd	nd	nd	0.43J
Vinyl chloride	MW-104	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.66	<0.5
	MW-108a	0.60	<0.5	<0.5	<0.5	0.91	<0.5	<0.5	0.38J	<0.5
	MW-108b	0.48J	0.52	<0.5	<0.5	1.03	<0.5	<0.5	0.43J	<0.5
	MW-108c	na	0.72	0.58	0.58	0.99	<0.5	<0.5	0.4J	na
	MW-108d	na	na	na	na	<0.5	<0.5	na	na	na
	MW-108e	na	na	na	na	na	<0.5	na	na	na

Table 2

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Organic Analytes
All concentrations are in parts per billion (ug/L).

#285 20AUG05
by BAP ck RMB/rsh app RDH

KEY: < = less than reporting limit; J = estimated; T = tentatively identified compound; ND = nd = TIC not detected; na = not analyzed

Analyte	Well	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Dec-03
1,1-Dichloroethane	MW-108a	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MW-108b	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MW-108c	na	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na
	MW-108d	na	na	na	na	<0.5	<0.5	na	na	na
	MW-108e	na	na	na	na	na	<0.5	na	na	na
1,2-Dichloroethane	MW-108a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3J
	MW-108b	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	MW-108c	na	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	na
	MW-108d	na	na	na	na	<0.5	<0.5	na	na	na
	MW-108e	na	na	na	na	na	<0.5	na	na	na
2,4-Dimethylphenol	MW-108a	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	MW-108b	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	MW-108c	na	<5.0	4J	<5.0	<5.0	<5.0	<5.0	<5.0	na
	MW-108d	na	na	1J	na	3.8J	<5.0	na	na	na
	MW-108e	na	na	<5.0	na	na	2.7J	na	na	na
	MW-108f	na	na	<5.0	na	na	<5.0	na	na	na
	MW-108g	na	na	na	na	na	<5.0	na	na	na
	MW-M3a	<5.0	<5.0	<2	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	MW-M3b	na	na	3J	<5.0	na	na	na	na	na
Benzene	MW-108a	1.55	2.27	2.67	<0.5	<0.5	0.72	<0.5	<0.5	0.3J
	MW-108b	1.73	1.33	2.78	<0.5	<0.5	0.56	<0.5	<0.5	0.25J
	MW-108c	na	0.64	<0.5	<0.5	1.18	0.52	<0.5	<0.5	na
	MW-108d	na	na	na	na	<0.5	1.5	na	na	na
	MW-108e	na	na	na	na	na	0.69	na	na	na
	MW-M3a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
	MW-M3b	na	na	na	<0.5	na	na	na	na	na
Ethylbenzene	MW-108a	19	59	11	<0.5	<0.5	34	11	3.3	3.6
	MW-108b	22	30	12	<0.5	<0.5	29	7.5	4	2.1
	MW-108c	na	32	11	10	<0.5	63	8.5	2.7	na
	MW-108d	na	na	na	na	19	67	na	na	na
	MW-108e	na	na	na	na	na	32	na	na	na
	MW-M3a	45	41	67	79	35	29	15	1.8	4.8
	MW-M3b	na	na	na	82	na	na	na	na	na
	PW-A120	na	na	4	na	na	na	na	na	na

Cross Brothers Site
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#285 20AUG05
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Analyte	Well	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Dec-03
cis-1,2-Dichloroethene	MW-108a	2.85	1.67	<0.5	<0.5	9.42	2.50	4.27	6.99	3
	MW-108b	2.09	3.19	<0.5	<0.5	9.48	3.06	3.93	7.02	3.6
	MW-108c	na	4.84	4.37	5.58	9.72	3.02	3.73	7.07	na
	MW-108d	na	na	na	na	1.58	0.43J	na	na	na
	MW-108e	na	na	na	na	na	2.95	na	na	na
	MW-M3a	<0.5	0.95	3.05	0.59	0.39J	0.49J	0.46J	<0.5	0.41J
	MW-M3b	na	na	na	0.64	na	na	na	na	na
trans-1,2-Dichloroethene	MW-108a	1.01	0.68	<0.5	<0.5	1.12	0.83	1.4	0.92	1.60
	MW-108b	0.89	1.29	<0.5	<0.5	1.21	1.17	1.56	1.02	1.70
	MW-108c	na	1.65	1.81	1.90	0.94	0.98	1.09	0.94	na
	MW-108d	na	na	na	na	0.73	0.56	na	na	na
	MW-108e	na	na	na	na	na	0.98	na	na	na
Xylenes	MW-108a	62	190	12	<0.5	16	110	53	15	44
	MW-108b	70	66	12	<0.5	15	79	44	17	35
	MW-108c	na	140	38	34	6.3	230	40	12	na
	MW-108d	na	na	na	na	190	170	na	na	na
	MW-108e	na	na	na	na	na	74	na	na	na
	NE-10a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5
	NE-10b	na	na	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5
	MW-M3a	340	240	190	620	290	270	140	26	300
	MW-M3b	na	na	na	590	na	na	na	na	na
Chloroethane	MW-108a	0.70	<0.5	<0.5	<0.5	0.75	0.57	0.83	<0.5	<0.5
	MW-108b	0.70	1	<0.5	<0.5	0.83	0.79	0.96	<0.5	<0.5
	MW-108c	na	1	2	1	0.52	0.7	0.6	<0.5	na
	MW-108d	na	na	na	na	0.59	<0.5	na	na	na
	MW-108e	na	na	na	na	na	0.64	na	na	na
	NE-10a	0.80	1	1	<0.5	<0.5	<0.5	<0.5	0.94	0.77
	NE-10b	na	na	1	<0.5	<0.5	<0.5	<0.5	0.93	0.71
	MW-103	<0.5	<0.5	<0.5	<0.5	0.96	0.49J	0.68	0.66	<0.5

Cross Brothers Site
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Analyte	Well	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Dec-03
Isophorone	MW-108a	<5.0	<5.0	5J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	MW-108b	<5.0	<5.0	16J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	MW-108c	na	<5.0	7	<5.0	<5.0	<5.0	<5.0	<5.0	na
	MW-108d	na	na	11J	na	2.6J	<5.0	na	na	na
	MW-108e	na	na	<5.0	na	na	2.1J	na	na	na
	MW-108f	na	na	2J	na	na	<5.0	na	na	na
	MW-108g	na	na	na	na	na	<5.0	na	na	na
	MW-104	<5.0	<5.0	<5.0	<5.0	<5.0	1.7J	4.7J	2J	<5.0
	NE-10a	22	4J	2J	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	NE-10b	na	na	4J	<5.0	<5.0	<5.0	<5.0	2.2J	<5.0
	NE-10c	na	na	3J	na	na	na	na	na	na
	NE-10d	na	na	2J	na	na	na	na	na	na
	MW-103	<5.0	<5.0	<5.0	<5.0	<5.0	4.9J	5.7	5.4	<5.0

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Analyte	Well	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Dec-03
Tetrachloroethylene	MW-109	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	PW-A120	na	na	0.4J	na	na	na	na	na	na
Methyl ethyl ketone	MW-109	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	<2.0	<2.0
Aniline	NE-10a	nd	nd	129.2[T]	nd	50.5[T]	nd	91.5[T]	nd	94
	NE-10b	na	na	128.1	nd	46.6[T]	nd	80.7[T]	nd	83
Toluene	MW-M3a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.85	<0.5
	MW-M3b	na	na	na	<0.5	na	na	na	na	na
	PW-A120	na	na	0.3J	na	na	na	na	na	na
sec-Butylbenzene	MW-M3	nd	nd	nd	nd	nd	nd	nd	nd	0.56
Isopropylbezene	MW-M3	nd	nd	nd	nd	nd	nd	nd	nd	4.3
n-Propylbenzene	MW-M3	nd	3[T]	nd	nd	nd	nd	2.0[T]	nd	3
1,2,4-Trimethylbenzene	MW-M3	nd	35[T]	nd	5[T]	nd	2[T]	13[T]	nd	6.2
1,3,5-Trimethylbenzene	MW-M3	6.0[T]	19[T]	nd	11[T]	nd	4[T]	13[T]	2[T]	2.2
Acetone	PW-A120	na	na	10	na	na	na	na	na	na
Trichloroethylene	PW-A120	na	na	7	na	na	na	na	na	na

Cross Brothers Site
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Inorganic Analytes

#285 20AUG05
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Analyte	Well	Dec-03	Mar-04
Sodium	MW-101(hu)	3300.0	na
	MW-101(hf)	3300.0	na
	MW-102(hu)	4400.0	na
	MW-102(hf)	4500.0	na
	MW-103(hu)	3700.0	na
	MW-103(hf)	3800.0	na
	MW-105(hu)	5800.0	na
	MW-105(eu)	5180.0J	na
	MW-105(hf)	5600.0	na
	MW-106(hu)	5700.0	na
	MW-106(eu)	5240.0J	na
	MW-106(hf)	5600.0	na
	MW-104(hu)	6200.0	na
	MW-104(hf)	6900.0	na
	MW-107(hu)	13000.0	na
	MW-107(eu)	9160.0J	na
	MW-107(hf)	14000.0	na
	MW-108(hu)a	4400.0	na
	MW-108(hu)b	4600.0	na
	MW-108(hf)a	4500.0	na
	MW-108(hf)b	4300.0	na
	MW-109(hu)	5100.0	na
	MW-109(hf)	3200.0	na
	NE-3(hu)	2700.0	na
	NE-3(hf)	2200.0	na
	NE-10(hu)a	4600.0	na
	NE-10(hu)b	4600.0	na
	NE-10(hf)a	4500.0	na
	NE-10(hf)b	4400.0	na
	MW-M3(hu)	4400.0	na
	MW-M3(hf)	4300.0	na
	MW-110(hu)	2600.0	na
	MW-110(hf)	2600.0	na
	H-1 (hu)	na	27000.0
	H-1 (eu)	na	27600.0
	H-1 (hf)	na	27000.0
	H-28 Shallow (hu)	na	2600.0
	H-28 Shallow (hf)	na	2300.0
	H-28 Deep (hu)	na	24000.0
	H-28 Deep (eu)	na	24500.0
	H-28 Deep (hf)	na	24000.0

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Analyte	Well	Dec-03	Mar-04
Magnesium	MW-101(hu)	8900.0	na
	MW-101(eu)a	8400.0J	na
	MW-101(eu)b	8540.0J	na
	MW-101(hf)	8900.0	na
	MW-102(hu)	12000.0	na
	MW-102(eu)	10700.0	na
	MW-102(hf)	12000.0	na
	MW-103(hu)	7100.0	na
	MW-103(eu)	6830.0	na
	MW-103(hf)	7400.0	na
	MW-105(hu)	11000.0	na
	MW-105(eu)	10100.0J	na
	MW-105(hf)	11000.0	na
	MW-106(hu)	11000.0	na
	MW-106(eu)	10600.0J	na
	MW-106(hf)	11000.0	na
	MW-104(hu)	11000.0	na
	MW-104(eu)	12600.0	na
	MW-104(hf)	13000.0	na
	MW-107(hu)	4800.0	na
	MW-107(hf)	4700.0	na
	MW-108(hu)a	8000.0	na
	MW-108(hu)b	8600.0	na
	MW-108(eu)	7770.0	na
	MW-108(hf)a	8500.0	na
	MW-108(hf)b	7600.0	na
	MW-109(hu)	8800.0	na
	MW-109(eu)	8080.0	na
	MW-109(hf)	8300.0	na
	NE-3(hu)	6400.0	na
	NE-3(eu)	5820.0	na
	NE-3(hf)	3500.0	na
	NE-10(hu)a	12000.0	na
	NE-10(hu)b	12000.0	na
	NE-10(eu)	11200.0	na
	NE-10(hf)a	12000.0	na
	NE-10(hf)b	12000.0	na
	MW-M3(hu)	8000.0	na
	MW-M3(eu)	7380.0	na
	MW-M3(hf)	7800.0	na
	MW-110(hu)	8400.0	na
	MW-110(eu)	8000.0J	na
	MW-110(hf)	8200.0	na
	H-1 (hu)	na	8400.0
	H-1 (eu)	na	8240.0
	H-1 (hf)	na	8400.0
	H-2S Shallow (hu)	na	7300.0
	H-2S Shallow (eu)	na	7090.0
	H-2S Shallow (hf)	na	7200.0
	H-2S Shallow/RWD (eu)	na	7050.0
	H-2S Deep (hu)	na	23000.0
	H-2S Deep (eu)	na	22600.0
	H-2S Deep (hf)	na	22000.0

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Inorganic Analytes

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Analyte	Well	Dec-03	Mar-04
Iron	MW-101(hu)	240.0	na
	MW-101(eu)a	287.0J	na
	MW-101(eu)b	298.0J	na
	MW-101(hf)	170.0J+	na
	MW-102(hu)	3080.0	na
	MW-102(eu)	2320.0	na
	MW-102(hf)	460.0	na
	MW-103(hu)	2200.0	na
	MW-103(eu)	1800.0	na
	MW-103(hf)	570.0	na
	MW-105(hu)	460.0	na
	MW-105(eu)	424.0J	na
	MW-106(hu)	680.0	na
	MW-106(eu)	902.0J	na
	MW-106(hf)	290.0J+	na
	MW-104(hu)	950.0	na
	MW-104(eu)	926.0	na
	MW-107(hu)	1100.0	na
	MW-107(eu)	616.0	na
	MW-108(hu)a	4600.0	na
	MW-108(hu)b	4600.0	na
	MW-108(eu)	4310.0	na
	MW-108(hf)a	4200.0	na
	MW-108(hf)b	4100.0	na
	MW-109(hu)	550.0	na
	MW-109(eu)	372.0	na
	MW-109(hf)	190.0J+	na
	NE-3(hu)	130.0	na
	NE-3(eu)	133.0	na
	NE-3(hf)	220.0J+	na
	NE-10(hu)a	1300.0	na
	NE-10(hu)b	1300.0	na
	NE-10(eu)	1180.0	na
	NE-10(hf)a	1100.0	na
	NE-10(hf)b	1200.0	na
	MW-M3(hu)	10000.0	na
	MW-M3(eu)	9420.0	na
	MW-M3(hf)	8900.0	na
	MW-110(hu)	1600.0	na
	MW-110(eu)	1270.0J	na
	H-1 (hu)	na	750.0
	H-1 (eu)	na	746.0
	H-1 (hf)	na	620.0
	H-28 Shallow (hu)	na	2700.0
	H-28 Shallow (eu)	na	3690.0
	H-28 Shallow (hf)	na	200.0
	H-28 Shallow/RWD (eu)	na	3730.0
	H-28 Deep (hu)	na	590.0
	H-28 Deep (eu)	na	684.0
	H-28 Deep (hf)	na	79.0

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Analyte	Well	Dec-03	Mar-04
Barium	MW-101(hu)	17.0J+	na
	MW-102(hu)	24.0J+	na
	MW-103(hu)	58.0	na
	MW-103(hf)	71.0J+	na
	MW-105(hu)	19.0J+	na
	MW-106(hu)	29.0J+	na
	MW-104(hu)	20.0J+	na
	MW-104(hf)	90.0J+	na
	MW-107(hu)	97.0	na
	MW-107(hf)	100.0J+	na
	MW-108(hu)a	25.0J+	na
	MW-108(hu)b	26.0J+	na
	MW-109(hu)	47.0	na
	MW-3(hu)	11.0J+	na
	MW-106(hu)a	25.0J+	na
	MW-106(hu)b	24.0J+	na
	MW-M3(hu)	22.0J+	na
	MW-110(hu)	19.0J+	na
	H-1(hu)	na	38.0
	H-1(eu)	na	36.0J
	H-1(hf)	na	68.0
	H-28 Shallow (eu)	na	2.2J
	H-28 Shallow (hf)	na	34.0
	H-28 Shallow/RWD (eu)	na	2.3J
	H-28 Deep (hu)	na	25.0
	H-28 Deep (eu)	na	24.9J
	H-28 Deep (hf)	na	58.0

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Analyte	Well	Dec-03	Mar-04
Calcium	MW 101(hu)	33000.0	na
	MW 101(eu)a	31300.0J	na
	MW-101(eu)b	31900.0J	na
	MW 101(hf)	33000.0	na
	MW 102(hu)	51000.0	na
	MW 102(eu)	47500.0	na
	MW 102(hf)	52000.0	na
	MW 103(hu)	38000.0	na
	MW 103(eu)	36200.0	na
	MW 103(hf)	39000.0	na
	MW 105(hu)	39000.0	na
	MW 105(eu)	37200.0J	na
	MW 105(hf)	39000.0	na
	MW 106(hu)	39000.0	na
	MW 106(eu)	37800.0J	na
	MW 106(hf)	39000.0	na
	MW 104(hu)	46000.0	na
	MW 104(eu)	53200.0	na
	MW 104(hf)	54000.0	na
	MW 107(hu)	5100.0	na
	MW 107(eu)	5620.0	na
	MW 107(hf)	5600.0	na
	MW 108(hu)a	68000.0	na
	MW 108(hu)b	71000.0	na
	MW 108(eu)	65900.0	na
	MW 108(hf)a	71000.0	na
	MW 108(hf)b	68000.0	na
	MW 109(hu)	35000.0	na
	MW 109(eu)	32200.0	na
	MW 109(hf)	33000.0	na
	NE 3(hu)	26000.0	na
	NE 3(eu)	23600.0	na
	NE 3(hf)	11000.0	na
	NE 106(hu)a	42000.0	na
	NE 106(hu)b	43000.0	na
	NE 106(eu)	39600.0	na
	NE 106(hf)a	40000.0	na
	NE 106(hf)b	42000.0	na
	MW M3(hu)	54000.0	na
	MW M3(eu)	50600.0	na
	MW-M3(hf)	53000.0	na
	MW 110(hu)	33000.0	na
	MW 110(eu)	32200.0J	na
	MW 110(hf)	32000.0	na
	H-1(hu)	na	27000.0
	H-1(eu)	na	26000.0
	H-1(hf)	na	27000.0
	H-28 Shallow (hu)	na	20000.0
	H-28 Shallow (eu)	na	19400.0
	H-28 Shallow (hf)	na	20000.0
	H-28 Shallow/RWD (eu)	na	19300.0
	H-28 Deep (hu)	na	53000.0
	H-28 Deep (eu)	na	51300.0
	H-28 Deep (hf)	na	51000.0

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Inorganic Analytes

#285 20AUG05
by:BAP ck:RMB/rsh app RDH

All concentrations are in parts per billion (ug/L).

KEY: < = less than reporting limit, hu = Haag unfiltered, eu = EDI unfiltered, hf = Haag filtered, na = not analyzed
J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Cobalt	MW-102(hu)	2.8J	na
	MW-102(eu)	2.1J	na
	MW-102(hf)	1.3J	na
	MW-103(hu)	2.3J	na
	MW-103(eu)	2.6J	na
	MW-105(hu)	1.0J	na
	MW-104(hu)	1.6J	na
	MW-104(eu)	0.94J	na
	MW-107(hu)	1.8J	na
	MW-107(eu)	0.88J	na
	MW-108(hu)a	1.8J	na
	MW-108(hu)b	1.9J	na
	MW-108(eu)	1.8J	na
	MW-108(hf)a	1.2J	na
	MW-108(hf)b	1.7J	na
Nickel	MW-102(eu)	1.5J	na
	MW-103(hu)	5.8J	na
	MW-103(eu)	6.4J	na
	MW-103(hf)	3.7J	na
	MW-105(eu)	2.5J	na
	MW-104(eu)	1.7J	na
	MW-107(hu)	2.0J	na
	MW-107(eu)	2.7J	na
	MW-108(hu)a	3.2J	na
	MW-108(hu)b	3.2J	na
	MW-108(eu)	4.7J	na
	MW-108(hf)a	2.8J	na
	MW-108(hf)b	3.3J	na
	MW-109(hu)	3.3J	na
	MW-109(eu)	8.2J	na
	MW-M3(hu)	52.0	na
	MW-M3(eu)	41.8	na
	MW-M3(hf)	35.0	na
	MW-110(hu)	3.9J	na
	H-28 Shallow (hu)	na	5.8J
	H-28 Deep (hu)	na	3.7J

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Inorganic Analytes

#285 20AUG05
by:BAP ck:RMB/rsh app: RDH

All concentrations are in parts per billion (ug/L).

KEY: < = less than reporting limit, hu = Haag unfiltered, eu = EDI unfiltered, hf = Haag filtered, na = not analyzed
J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Aluminum	MW-103(hu)	800.0	na
	MW-103(eu)	833.0	na
	MW-104(hu)	8900.0	na
	MW-104(eu)	8690.0	na
	MW-107(hu)	1800.0	na
	MW-107(eu)	1180.0	na
	H-28 Shallow (hu)	na	49.0J
	H-28 Deep (hu)	na	350.0
	H-28 Deep (eu)	na	368.0
Vanadium	MW-103(eu)	1.2J	na
	MW-106(eu)	0.92J	na
	MW-107(hu)	2.7J	na
	MW-107(eu)	2.0J	na
Arsenic	MW-104(hu)	9.8J	na
	MW-108(hu)a	11.0	na
	MW-108(hu)b	8.4J	na
	MW-108(hf)a	8.6J	na
	MW-108(hf)b	6.6J	na
Beryllium	MW-102(eu)	0.05J	na
	MW-103(eu)	0.13J	na
	MW-104(hu)	5.2	na
	MW-104(eu)	5.3	na
	MW-107(eu)	0.07J	na
Copper	MW-101(eu)a	1.2J	na
	MW-102(eu)	1.4J	na
	MW-103(eu)	6.2J	na
	MW-105(eu)	1.6J	na
	MW-104(eu)	6.6J	na
	MW-107(hu)	18.0J+	na
	MW-107(eu)	13.0J	na
	MW-107(hf)	15.0J+	na
	MW-109(eu)	5.1J	na
	MW-110(eu)	1.4J	na
	H-28 Shallow (hu)	na	26.0
	H-28 Shallow (eu)	na	26.8
	H-28 Shallow (hf)	na	12.0
	H-28 Shallow/RWD (eu)	na	48.5
	H-28 Deep (hu)	na	45.0
	H-28 Deep (eu)	na	48.0
	H-28 Deep (hf)	na	6.3J

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Inorganic Analytes

#285 20AUG05
by:BAP ck:RMB/rsh app: RDH

All concentrations are in parts per billion (ug/L).

KEY < = less than reporting limit, hu = Haag unfiltered, eu = EDI unfiltered, hf = Haag filtered, na = not analyzed
J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Lead	MW-107(hu)	3.8J	na
	MW-109(hu)	3.5J	na
	H-28 Shallow (hu)	na	3.2J
	H-28 Shallow/RWD (eu)	na	10.4
	H-28 Deep (hu)	na	7.0
	H-28 Deep (eu)	na	6.7J
Potassium	MW-101(hu)	710.0J+	na
	MW-101(hf)	670.0J+	na
	MW-102(hu)	1400.0	na
	MW-102(hf)	1300.0	na
	MW-103(hu)	1400.0	na
	MW-103(hf)	1200.0J+	na
	MW-105(hu)	890.0J+	na
	MW-105(hf)	780.0J+	na
	MW-106(hu)	760.0J+	na
	MW-106(hf)	680.0J+	na
	MW-104(hu)	1500.0	na
	MW-104(hf)	1400.0	na
	MW-107(hu)	19000.0	na
	MW-107(eu)	17600.0	na
	MW-107(hf)	16000.0	na
	MW-108(hu)a	2200.0	na
	MW-108(hu)b	2200.0	na
	MW-108(hf)a	2000.0	na
	MW-108(hf)b	2100.0	na
	MW-109(hu)	1200.0J+	na
	MW-109(hf)	1000.0J+	na
	NE-3(hu)	1600.0	na
	NE-3(hf)	1700.0	na
	NE-10(hu)a	1300.0	na
	NE-10(hu)b	1400.0	na
	NE-10(hf)a	1100.0J+	na
	NE-10(hf)b	1200.0J+	na
	MW-M3(hu)	2300.0	na
	MW-M3(hf)	2100.0	na
	MW-110(hu)	3700.0	na
	MW-110(hf)	3400.0	na
	H-1 (hu)	na	2700.0
	H-1 (eu)	na	3000.0J
	H-1 (hf)	na	2700.0
	H-28 Shallow (hu)	na	1200.0J+
	H-28 Shallow (eu)	na	1130.0J
	H-28 Shallow (hf)	na	1100.0J+
	H-28 Shallow/RWD (eu)	na	1130.0J
	H-28 Deep (hu)	na	4000.0
	H-28 Deep (eu)	na	4510.0J
	H-28 Deep (hf)	na	3800.0

Cross Brothers Site

Well-by-Well Groundwater Concentrations for Trial Shutdown

Inorganic Analytes

#285 20AUG05

All concentrations are in parts per billion (ug/L).

by:BAP ck:RMB/rsh app: RDH

KEY < = less than reporting limit, hu = Haag unfiltered, eu = EDI unfiltered, hf = Haag filtered, na = not analyzed

J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Cadmium	MW-102(eu)	0.40J	na
	MW-104(eu)	0.34J	na
	MW-107(eu)	0.42J	na
	MW-109(hu)	1.3J	na
	MW-109(eu)	1.8J	na
Cyanide, Total	MW-101(eu)b	11.0J	na
	MW-M3(hu)	6.4J	na
	MW-M3(eu)	11.2	na
	MW-M3(hf)	4.8J	na
	H-1 (eu)	na	13.3
	H-28 Shallow (eu)	na	12.5
Zinc	MW-101(eu)a	2.8J	na
	MW-101(eu)b	3.5J	na
	MW-105(hu)	40.0J+	na
	MW-105(eu)	36.2J	na
	MW-106(eu)	6.8J	na
	MW-104(hu)	40.0J+	na
	MW-107(hu)	33.0J+	na
	MW-107(hf)	84.0J+	na
	MW-110(hu)	47.0J+	na
	MW-110(eu)	39.6J	na
	H-1 (hu)	na	24.0
	H-1 (eu)	na	30.0J
	H-1 (hf)	na	100.0
	H-28 Shallow (hu)	na	750.0
	H-28 Shallow (eu)	na	991.0
	H-28 Shallow (hf)	na	120.0
	H-28 Shallow/RWD (eu)	na	1150.0
	H-28 Deep (hu)	na	66.0
	H-28 Deep (eu)	na	69.8
	H-28 Deep (hf)	na	73.0

Cross Brothers Site
Well-by-Well Groundwater Concentrations for Trial Shutdown
Inorganic Analytes

#285 20A1'G05
by BAP ck RMB/rsh app: RDH

All concentrations are in parts per billion (ug/L).

KEY < = less than reporting limit, hu = Haag unfiltered, eu = EDI unfiltered, hf = Haag filtered, na = not analyzed
J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Manganese	MW-101(hu)	67.0	na
	MW-101(eu)a	62.2J	na
	MW-101(eu)b	62.9J	na
	MW-101(hf)	66.0	na
	MW-102(hu)	81.0	na
	MW-102(eu)	72.5	na
	MW-102(hf)	75.0	na
	MW-103(hu)	59.0	na
	MW-103(eu)	56.1	na
	MW-103(hf)	47.0	na
	MW-105(hu)	330.0	na
	MW-105(eu)	315.0J	na
	MW-105(hf)	12.0J+	na
	MW-106(hu)	110.0	na
	MW-106(eu)	101.0J	na
	MW-106(hf)	100.0	na
	MW-104(hu)	53.0	na
	MW-104(eu)	57.2	na
	MW-104(hf)	44.0	na
	MW-107(hu)	31.0	na
	MW-107(eu)	26.5	na
	MW-107(hf)	18.0J+	na
	MW-108(hu)a	79.0	na
	MW-108(hu)b	81.0	na
	MW-108(eu)	75.5	na
	MW-108(hf)a	80.0	na
	MW-108(hf)b	76.0	na
	MW-109(hu)	33.0	na
	MW-109(eu)	34.0	na
	MW-109(hf)	19.0J+	na
	NE-3(hu)	73.0	na
	NE-3(eu)	64.8	na
	NE-3(hf)	130.0	na
	NE-10(hu)a	43.0	na
	NE-10(hu)b	45.0	na
	NE-10(eu)	40.4	na
	NE-10(hf)a	40.0	na
	NE-10(hf)b	43.0	na
	MW-M3(hu)	350.0	na
	MW-M3(eu)	330.0	na
	MW-M3(hf)	340.0	na
	MW-110(hu)	580.0	na
	MW-110(eu)	345.0J	na
	MW-110(hf)	21.0J+	na
	H-1 (hu)	na	18.0
	H-1 (eu)	na	18.3
	H-1 (hf)	na	18.0
	H-28 Shallow (hu)	na	26.0
	H-28 Shallow (eu)	na	25.3
	H-28 Shallow (hf)	na	21.0
	H-28 Shallow/RWD (eu)	na	25.5
	H-28 Deep (hu)	na	16.0
	H-28 Deep (eu)	na	16.9

Cross Brothers Site

Well-by-Well Groundwater Concentrations for Trial Shutdown

Inorganic Analytes

#285 20AUG05

All concentrations are in parts per billion (ug/L).

by:BAP ck RMB/rsh app RDH

KEY: < = less than reporting limit. hu = Haag unfiltered. eu = EDI unfiltered, hf = Haag filtered, na = not analyzed

J = estimated, J+ = biased high

Analyte	Well	Dec-03	Mar-04
Chromium	MW-101(eu)a	0.67J	na
	MW-101(eu)b	0.96J	na
	MW-102(eu)	0.8J	na
	MW-103(hu)	1.5J	na
	MW-103(eu)	1.6J	na
	MW-105(eu)	1.6J	na
	MW-106(eu)	0.82J	na
	MW-104(hu)	2.1J	na
	MW-104(eu)	2.2J	na
	MW-107(hu)	3.6J	na
	MW-107(eu)	2.7J	na
	MW-108(eu)	0.42J	na
	MW-109(hu)	4.6J	na
	MW-109(eu)	12.5	na
	NE-3(eu)	0.88J	na
	NE-10(eu)	0.6J	na
	MW-M3(hu)	2.3J	na
	MW-M3(eu)	2.2J	na
	MW-110(hu)	4.4J	na
	MW-110(eu)	1.3J	na

Cross Brothers Site
Trailers - TCLP Detections Above Criteria

#285 20AUG05
by BAP ck BAP app RDH

All concentrations are in parts per million (mg/L).

Analyte	Sample	Sep-04	Comments
Lead, TCLP	278-Trailers 2,3,4,5	**1.90**	Composite results multiplied by 4 for comparison with TCLP limit
	Trailer #2	**0.12**	
	Trailer #3	**13.00**	This trailer floor was disposed of as hazardous waste
	Trailer #4	**2.80**	
	Trailer #5	**0.16**	

Cross Brothers Site
Borrow Soil for LAA Cover - Detections

#285 20AUG05
by BAP ck:BAP app: RDH

All concentrations are in parts per million (mg/kg).

Analyte	Soil Sample	Mar-04
Acetone	CB-SS-196	**0.0440**
	CB-SS-194	**0.0300**
	CB-SS-192	**0.0870**
2- Butanone (MEK)	CB-SS-192	**0.0066**

Analytical Results (Qualified Data)

Case #: 32471 SDG : ME2E75
Site : CROSS BROTHERS Number of Soil Samples : 0
Lab. : BONNER Number of Water Samples : 9
Reviewer : J. GANZ
Date : JANUARY 15, 2004

Sample Number :	ME2E75		ME2E78		ME2E79		ME2E80		ME2E83	
Sampling Location :	M3		MW-102		MW-103		MW-104		MW-107	
Matrix :	Water		Water		Water		Water		Water	
Units :	ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :	12/18/2003		12/17/2003		12/17/2003		12/17/2003		12/18/2003	
Time Sampled :	14:15		12:05		15:00		15:55		08:40	
%Solids :	0.0		0.0		0.0		0 0		0.0	
Dilution Factor :	1.0		1.0		1.0		1 0		1.0	
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	U	200	U	833		8690		1180	
ANTIMONY	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U
ARSENIC	15.0	U	15 0	U	15 0	U	15 0	U	15 0	U
BARIUM	200	U	200	U	200	U	200	U	200	U
BERYLLIUM	5 0	U	0 050	J	0 13	J	5 3		0 070	J
CADMIUM	5.0	U	0.40	J	5.0	U	0.34	J	0.42	J
CALCIUM	50600		47500		36200		53200		5620	
CHROMIUM	2.2	J	0.80	J	1.6	J	2.2	J	2.7	J
COBALT	50.0	U	2.1	J	2.6	J	0.94	J	0.88	J
COPPER	25.0	U	1.4	J	6.2	J	6.6	J	13.0	J
IRON	9420		2320		1800		926		616	
LEAD	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
MAGNESIUM	7380		10700		6830		12600		5000	U
MANGANESE	330		72.5		56.1		57.2		26.5	
MERCURY	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
NICKEL	41.8		1.5	J	6.4	J	1.7	J	2.7	J
POTASSIUM	5000	U	5000	U	5000	U	5000	U	17600	
SELENIUM	35.0	U	35.0	U	35.0	U	35.0	U	35.0	U
SILVER	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
SODIUM	5000	UJ	5000	UJ	5000	UJ	5000	UJ	9160	J
THALLIUM	25.0	U	25.0	U	25.0	U	25.0	U	25.0	U
VANADIUM	50.0	U	50.0	U	1.2	J	50.0	U	2.0	J
ZINC	60.0	U	60.0	U	60 0	U	60 0	U	60.0	U
CYANIDE	11.2		10.0	U	10.0	U	10.0	U	10.0	U

Table 3

Analytical Results (Qualified Data)

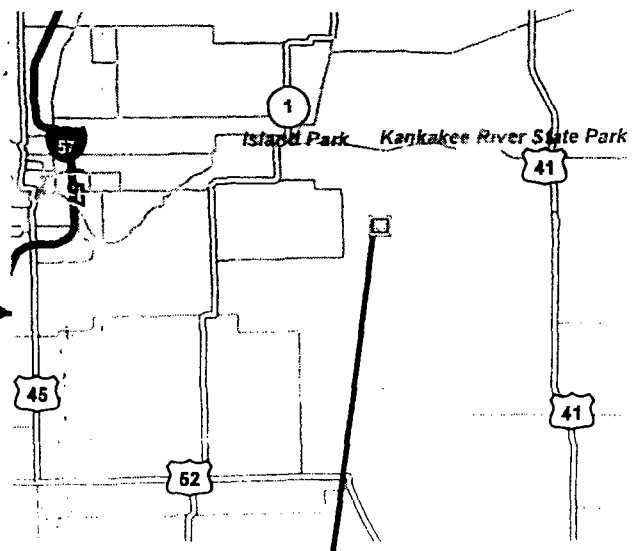
Case # 32471 SDG ME2E75
Site CROSS BROTHERS
Lab. . BONNER
Reviewer : J GANZ
Date . JANUARY 15, 2004

Sample Number :	ME2E84		ME2E85		ME2E88		ME2E89			
Sampling Location :	MW-108		MW-109		NE-10		NE-3			
Matrix .	Water		Water		Water		Water			
Units :	ug/L		ug/L		ug/L		ug/L			
Date Sampled :	12/18/2003		12/18/2003		12/17/2003		12/17/2003			
Time Sampled :	11:30		10:05		18:30		10:35			
%Solids :	0.0		0.0		0.0		0.0			
Dilution Factor :	1.0		1.0		1.0		1 0			
ANALYTE	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	U	200	U	200	U	200	U		
ANTIMONY	60.0	U	60.0	U	60.0	U	60.0	U		
ARSENIC	15.0	U	15 0	U	15 0	U	15.0	U		
BARIUM	200	U	200	U	200	U	200	U		
BERYLLIUM	5 0	U	5 0	U	5 0	U	5 0	U		
CADMIUM	5.0	U	1 8	J	5 0	U	5.0	U		
CALCIUM	65900		32200		39600		23600			
CHROMIUM	0.42	J	12.5		0.60	J	0.88	J		
COBALT	1.8	J	50 0	U	50 0	U	50 0	U		
COPPER	25.0	U	5.1	J	25.0	U	25.0	U		
IRON	4310		372		1180		133			
LEAD	10.0	U	10.0	U	10.0	U	10.0	U		
MAGNESIUM	7770		8080		11200		5820			
MANGANESE	75.5		34.0		40.4		64.8			
MERCURY	0.20	U	0.20	U	0.20	U	0.20	U		
NICKEL	4.7	J	8.2	J	40.0	U	40.0	U		
POTASSIUM	5000	U	5000	U	5000	U	5000	U		
SELENIUM	35.0	U	35.0	U	35.0	U	35.0	U		
SILVER	10.0	U	10.0	U	10.0	U	10.0	U		
SODIUM	5000	UJ	5000	UJ	5000	UJ	5000	UJ		
THALLIUM	25.0	U	25.0	U	25.0	U	25.0	U		
VANADIUM	50.0	U	50.0	U	50.0	U	50.0	U		
ZINC	60.0	U	60.0	U	60.0	U	60.0	U		
CYANIDE	10.0	U	10.0	U	10.0	U	10.0	U		

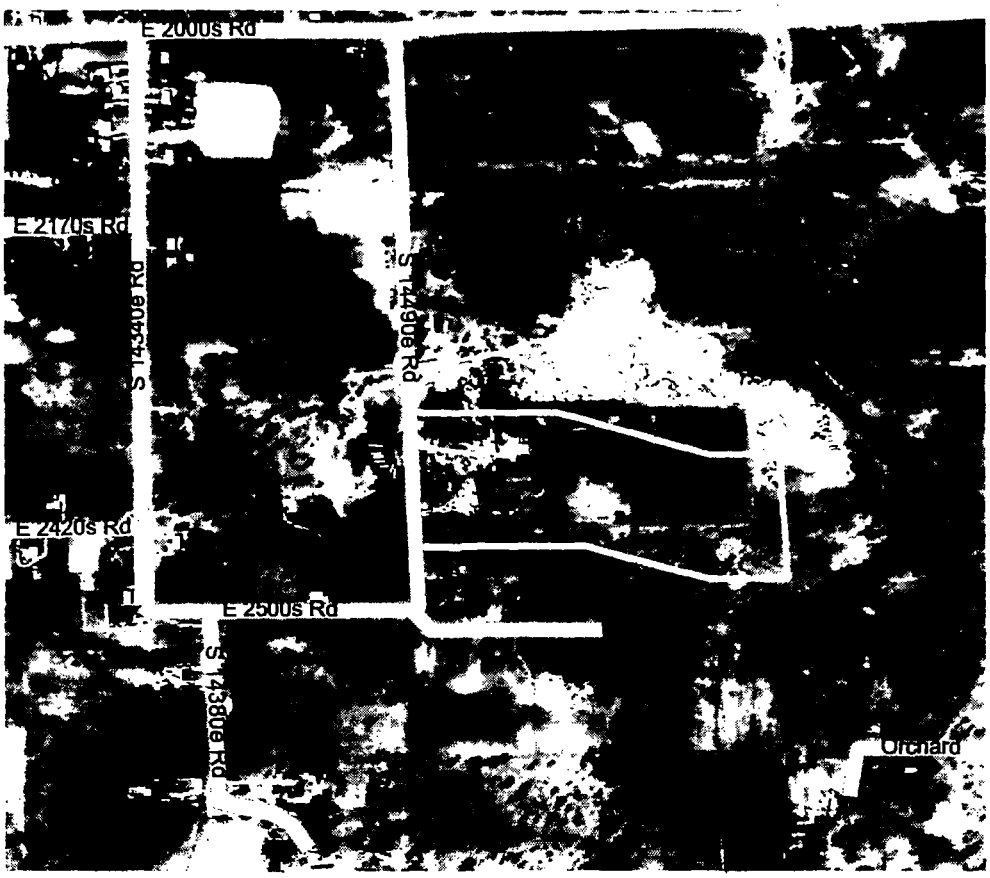
Cross Brothers Pail Recycling Superfund Site

1) State

2) Kankakee County



3) Cross Brothers Pail Recycling



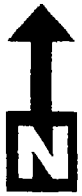


Figure 1

Plot created by Sarah Backhouse U.S. EPA Region 8/18/2005

GEOS
Groundwater Evaluation and Optimization System

Figure 2

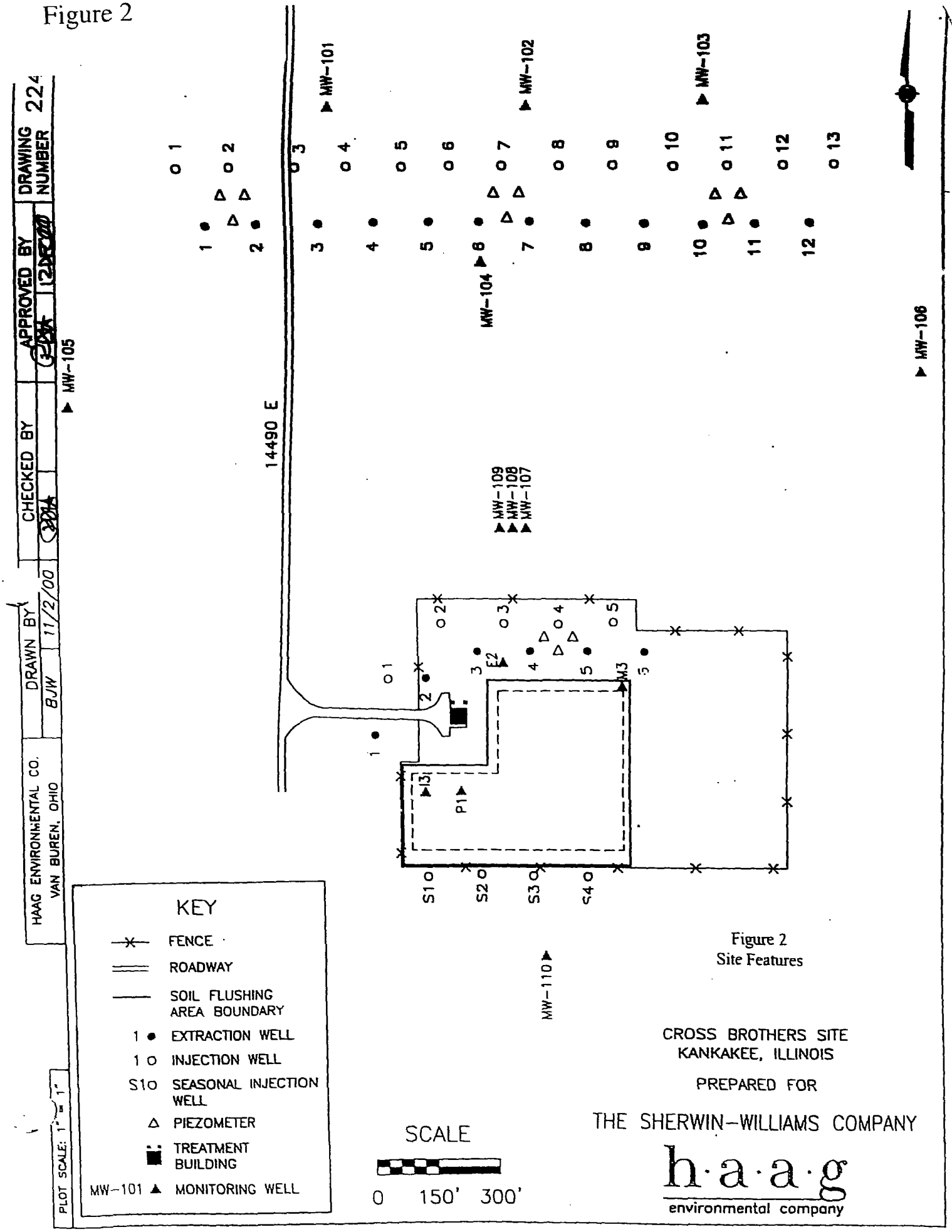
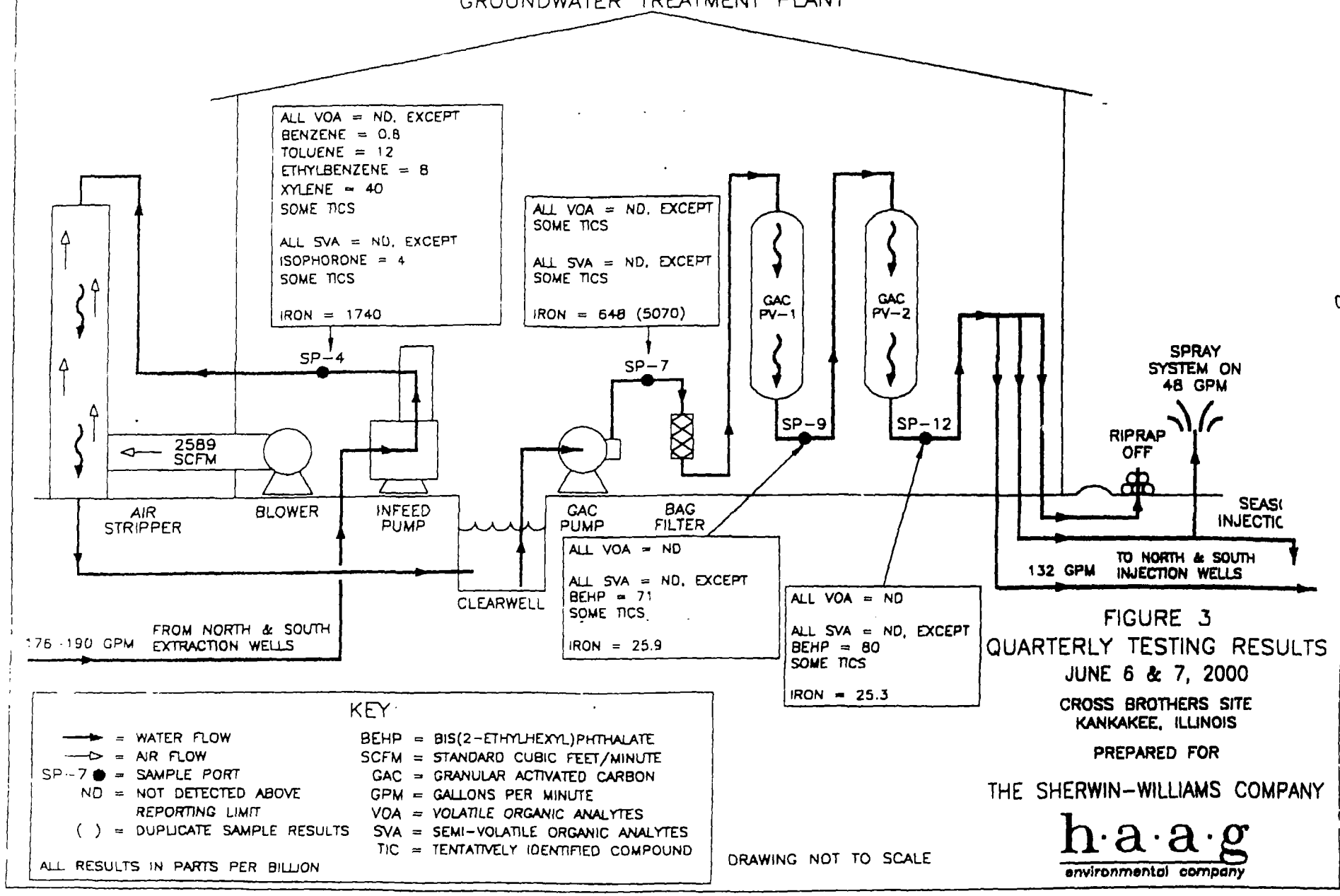


Figure 2
Site Features

PLOT SCALE: 1" = 1"	HAAG ENVIRONMENTAL CO. VAN BUREN, OHIO	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER
		BJW	7-11-00	KLS	4AUG00	[illegible]	4AUG00	224B0600



KEY

→ = WATER FLOW
⇢ = AIR FLOW
SP-7 ● = SAMPLE PORT
ND = NOT DETECTED ABOVE REPORTING LIMIT
( ) = DUPLICATE SAMPLE RESULTS

BEHP = BIS(2-ETHYLHEXYL)PHTHALATE
SCFM = STANDARD CUBIC FEET/MINUTE
GAC = GRANULAR ACTIVATED CARBON
GPM = GALLONS PER MINUTE
VOA = VOLATILE ORGANIC ANALYTES
SVA = SEMI-VOLATILE ORGANIC ANALYTES
TIC = TENTATIVELY IDENTIFIED COMPOUND

ALL RESULTS IN PARTS PER BILLION

DRAWING NOT TO SCALE

Figure 3

FIGURE 3
QUARTERLY TESTING RESULTS
JUNE 6 & 7, 2000
CROSS BROTHERS SITE
KANKAKEE, ILLINOIS
PREPARED FOR
THE SHERWIN-WILLIAMS COMPANY

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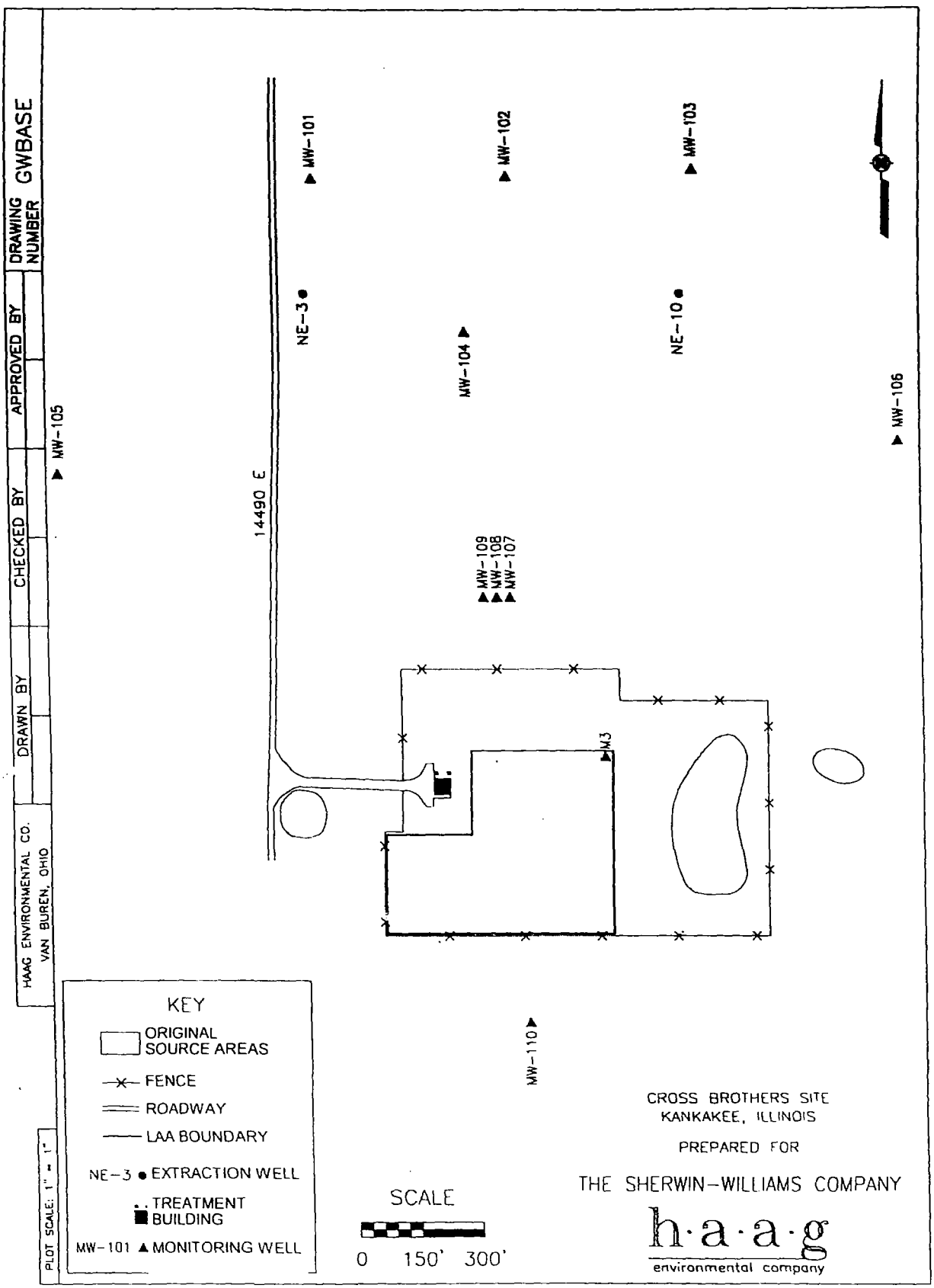
environmental company


DRAWING NUMBER GWBASE
APPROVED BY
CHECKED BY
DRAWN BY
HAAG ENVIRONMENTAL CO.
VAN BUREN, OHIO
PLOT SCALE: 1" = 1'
MW-101
MW-102
MW-103
MW-104
MW-105
MW-106
MW-107
MW-108
MW-109
MW-110
NE-3
NE-10
14490 E
M3
KEY
ORIGINAL SOURCE AREAS
FENCE
ROADWAY
LAA BOUNDARY
NE-3 EXTRACTION WELL
TREATMENT BUILDING
MW-101 MONITORING WELL
SCALE
0 150' 300'
CROSS BROTHERS SITE
KANKAKEE, ILLINOIS
PREPARED FOR
THE SHERWIN-WILLIAMS COMPANY
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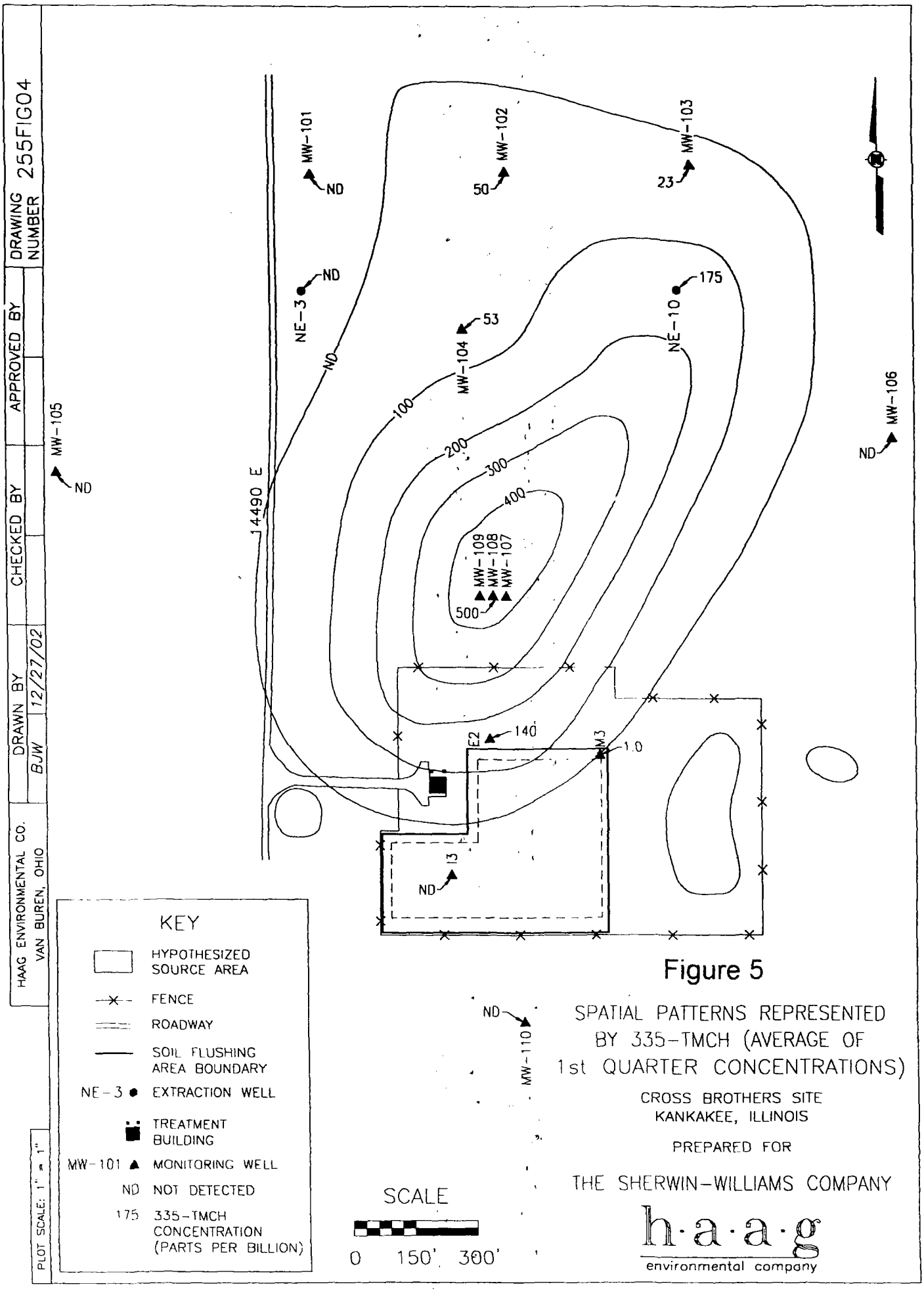

Figure 5

SPATIAL PATTERNS REPRESENTED BY 335-TMCH (AVERAGE OF 1st QUARTER CONCENTRATIONS)

CROSS BROTHERS SITE
KANKAKEE, ILLINOIS

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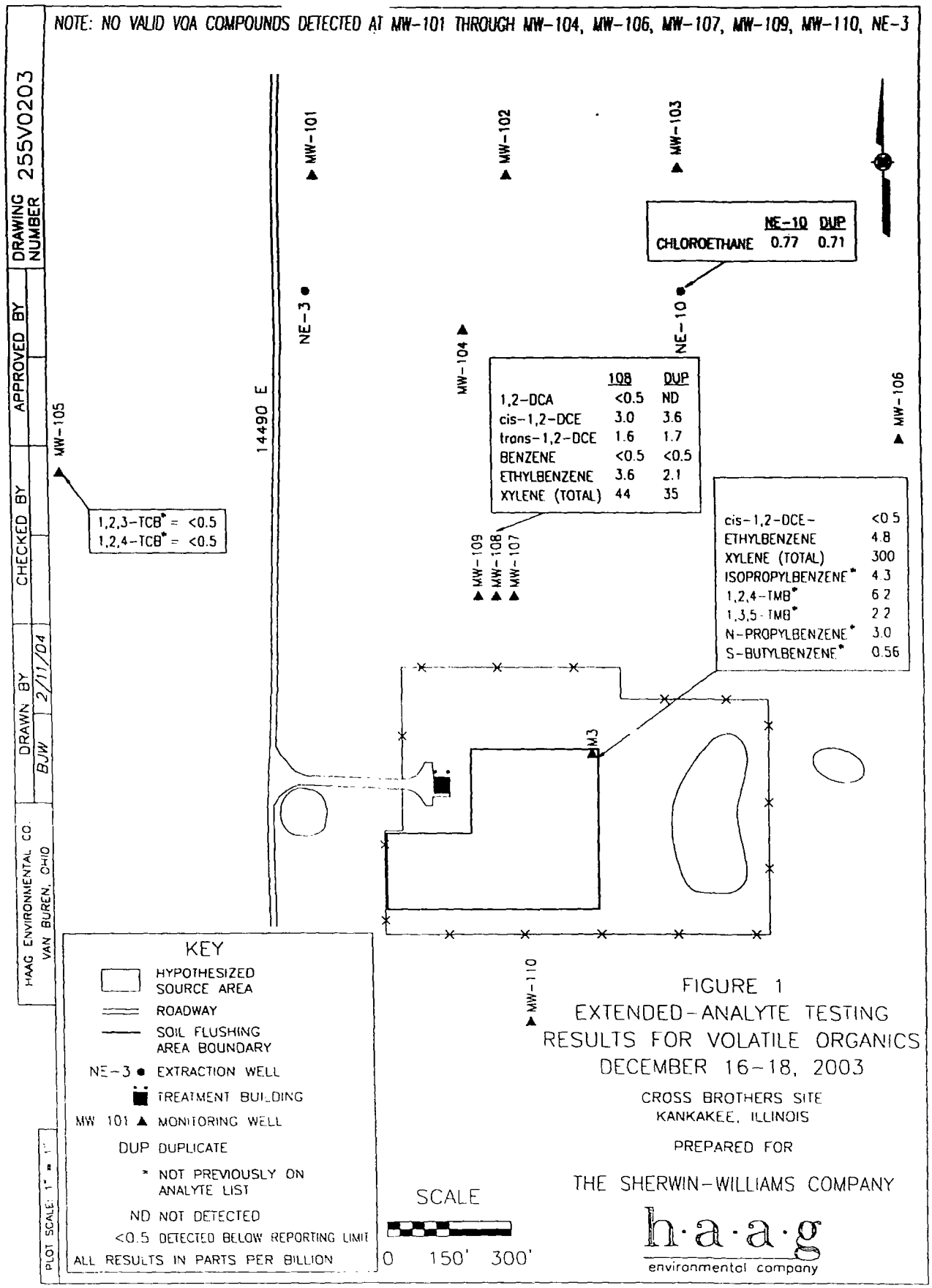
NOTE: NO VALID VOA COMPOUNDS DETECTED AT MW-101 THROUGH MW-104, MW-106, MW-107, MW-109, MW-110, NE-3
DRAWING NUMBER 255V0203
APPROVED BY
CHECKED BY
DRAWN BY BJW 2/11/04
HAAG ENVIRONMENTAL CO. VAN BUREN, OHIO
MW-101
MW-102
MW-103
MW-104
MW-105
MW-106
MW-107
MW-108
MW-109
MW-110
NE-3
NE-10
14490 E
M3
NE-10 DUP
CHLOROETHANE 0.77 0.71
108 DUP
1,2-DCA <0.5 ND
cis-1,2-DCE 3.0 3.6
trans-1,2-DCE 1.6 1.7
BENZENE <0.5 <0.5
ETHYLBENZENE 3.6 2.1
XYLENE (TOTAL) 44 35
1,2,3-TCB* = <0.5
1,2,4-TCB* = <0.5
cis-1,2-DCE- <0.5
ETHYLBENZENE 4.8
XYLENE (TOTAL) 300
ISOPROPYLBENZENE* 4.3
1,2,4-TMB* 6.2
1,3,5-TMB* 2.2
N-PROPYLBENZENE* 3.0
S-BUTYLBENZENE* 0.56
KEY
HYPOTHESIZED SOURCE AREA
ROADWAY
SOIL FLUSHING AREA BOUNDARY
NE-3 EXTRACTION WELL
TREATMENT BUILDING
MW 101 MONITORING WELL
DUP DUPLICATE
* NOT PREVIOUSLY ON ANALYTE LIST
ND NOT DETECTED
<0.5 DETECTED BELOW REPORTING LIMIT
ALL RESULTS IN PARTS PER BILLION
SCALE
0 150' 300'
FIGURE 1
EXTENDED-ANALYTE TESTING RESULTS FOR VOLATILE ORGANICS
DECEMBER 16-18, 2003
CROSS BROTHERS SITE
KANKAKEE, ILLINOIS
PREPARED FOR
THE SHERWIN-WILLIAMS COMPANY
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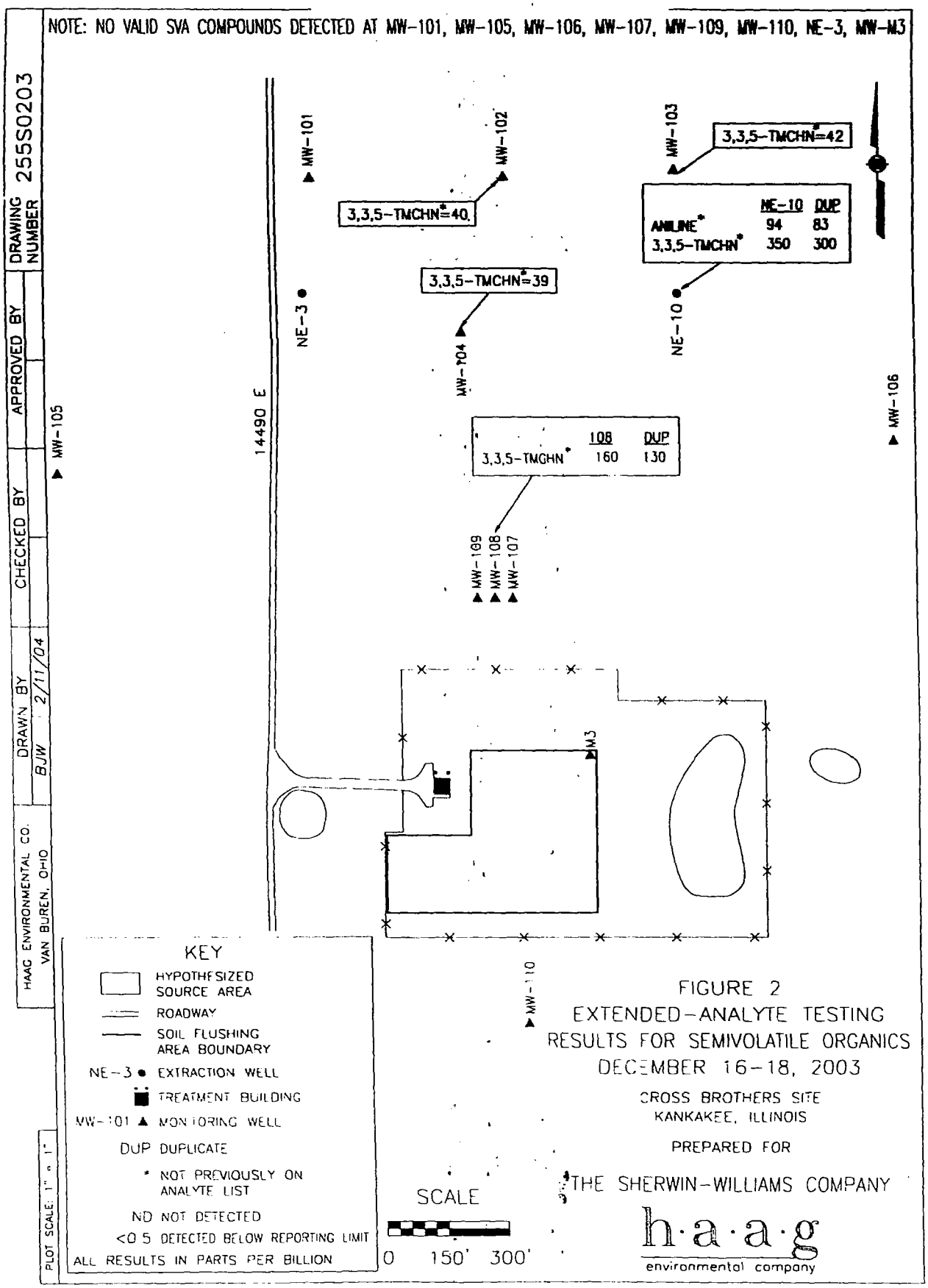
NOTE: NO VALID SVA COMPOUNDS DETECTED AT MW-101, MW-105, MW-106, MW-107, MW-109, MW-110, NE-3, MW-M3
DRAWING NUMBER 255S0203
APPROVED BY
CHECKED BY
DRAWN BY BJW 2/11/04
HAAG ENVIRONMENTAL CO. VAN BUREN, OHIO
MW-101
MW-102
MW-103
MW-104
MW-105
MW-106
MW-107
MW-108
MW-109
MW-110
MW-M3
NE-3
NE-10
14490 E
3,3,5-TMCHN*=40
3,3,5-TMCHN*=39
3,3,5-TMCHN*=42
NE-10 DUP
ANILINE* 94 83
3,3,5-TMCHN* 350 300
108 DUP
3,3,5-TMCHN* 160 130
KEY
HYPOTHESIZED SOURCE AREA
ROADWAY
SOIL FLUSHING AREA BOUNDARY
NE-3 EXTRACTION WELL
TREATMENT BUILDING
MW-101 MONITORING WELL
DUP DUPLICATE
* NOT PREVIOUSLY ON ANALYTE LIST
ND NOT DETECTED
<0.5 DETECTED BELOW REPORTING LIMIT
ALL RESULTS IN PARTS PER BILLION
PLOT SCALE: 1" = 1'
SCALE
0 150' 300'
FIGURE 2
EXTENDED-ANALYTE TESTING
RESULTS FOR SEMIVOLATILE ORGANICS
DECEMBER 16-18, 2003
CROSS BROTHERS SITE
KANKAKEE, ILLINOIS
PREPARED FOR
THE SHERWIN-WILLIAMS COMPANY
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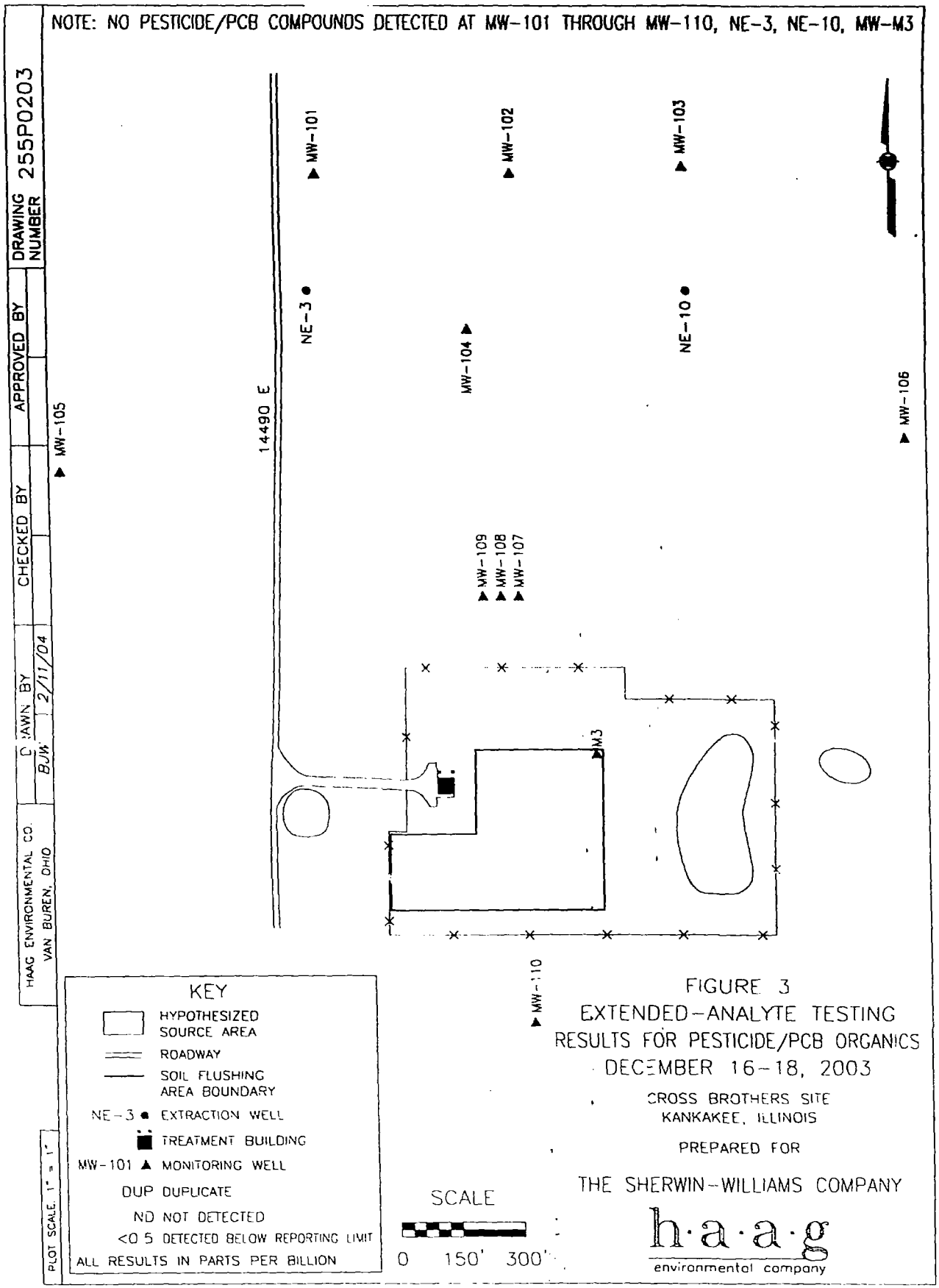
NOTE: NO PESTICIDE/PCB COMPOUNDS DETECTED AT MW-101 THROUGH MW-110, NE-3, NE-10, MW-M3
DRAWING NUMBER 255P0203
APPROVED BY
CHECKED BY
DRAWN BY BJW 2/11/04
HAAG ENVIRONMENTAL CO. VAN BUREN, OHIO
PLOT SCALE 1" = 1'
14490 E
MW-101
MW-102
MW-103
MW-104
MW-105
MW-106
MW-107
MW-108
MW-109
MW-110
NE-3
NE-10
M3
KEY
HYPOTHESIZED SOURCE AREA
ROADWAY
SOIL FLUSHING AREA BOUNDARY
NE-3 EXTRACTION WELL
TREATMENT BUILDING
MW-101 MONITORING WELL
DUP DUPLICATE
ND NOT DETECTED
<0 5 DETECTED BELOW REPORTING LIMIT
ALL RESULTS IN PARTS PER BILLION
SCALE
0 150' 300'
FIGURE 3
EXTENDED-ANALYTE TESTING
RESULTS FOR PESTICIDE/PCB ORGANICS
DECEMBER 16-18, 2003
CROSS BROTHERS SITE
KANKAKEE, ILLINOIS
PREPARED FOR
THE SHERWIN-WILLIAMS COMPANY
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environmental company